DOCUMENT RESUME

ED 288 050 CE 048 945

TITLE	Disasters and Development: A Peace Corps Pre-Service Training Module. Training for Development. Peace Corps Information Collection & Exchange Training Manual No. T-18.
INSTITUTION	INTERTECT, Dallas, TX.
SPONS AGENCY	Peace Corps, Washington, DC. Information Collection and Exchange Div.
PUB DATE	Jul 84
CONTRACT	PC-383-1017
NOTE	211p.
PUB TYPE	Guides - Classroom Use - Materials (For Learner) (051)
EDRS PRICE	MF01/PC09 Plus Postage.
DESCRIPTORS	*Developing Nations; Educational Resources; *Emergency Programs; Foreign Countries; Learning Modules; Lesson Plans; *Natural Disasters; Postsecondary Education; Rescue; Safety; Teaching Methods; Units of Study; Volunteers; *Volunteer Training; Workshops
IDENTIFIERS	*Peace Corps

ABSTRACT

This training module was developed for Peace Corps trainers overseas. It sets out step-by-step procedures for conducting a two-session introductory training program about natural disasters and their effects on development. The module uses four methods to provide trainees with a fundamental awareness of natural disasters and the roles Peace Corps volunteers can play: lecturettes, case study/play, structured group discussions, and handouts of printed reference materials. The module is organized in two parts. The first part describes the module and provides an assessment form. It also contains eight supplemental trainer references (information sheets). The second part of the module summarizes the module and provides information on conducting two training sessions on natural disasters and the role of Peace Corps volunteers in disaster mitigation and preparedness. Case studies, handouts, and assignments are included. Nine participant references (information sheets) are also included in this section. (KC)

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Peace Corps

DISASTERS AND DEVELOPMENT:

A Peace Corps Pre-Service Training Module

INTERTECT

P.O. Box 10502

Dallas, Texas 75207

March 1984

Developed for Peace Corps under
Contract No. PC-383-1017

Printed by:
Peace Corps
Information Collection and Exchange
July 1984

PREFACE

Many of the countries where Peace Corps Volunteers serve are at risk from natural hazards such as hurricanes, earthquakes, droughts or floods. Historically, PCVs have often played active roles in all phases of a disaster. Many PCVs have felt frustrated that they could not do more in times of great need (often dealing with life and death) or, in retrospect, that what actions they did take may not have been the most beneficial. Many have also felt that the disaster set back or even destroyed some of the progress the PCVs had been making in their development projects.

Yet up until this point, there has been no organized effort to design training materials to prepare PCVs for effectively managing an actual disaster or the potential threat of one. This deficiency has largely been due to the prevailing traditional attitude that "Peace Corps is a development agency -- not a relief agency". This attitude, in turn, reflected the tendency among people working in development to regard disasters as being separate and distinct events having little or no relationship to the development process. In recent years, however, the relationship between disasters and development has become clearer, and disasters are now recognized as being one of the major contributors to underdevelopment. It has also been recognized that, if disaster response is mishandled, many years of development activities can be wiped out or opportunities for further progress may be delayed. On the other hand, if the response is well planned and takes a developmental approach, a disaster can provide opportunities for accelerating the pace of development, and constructive changes can be made.

As development workers, it is important that Peace Corps Volunteers be aware of the impact of disasters and the opportunities that may be presented. The materials in this module have been developed to introduce Peace Corps trainees to natural hazards and how natural disasters can affect development. The information provided should prepare trainees to make decisions on appropriate actions to take during an emergency and how to integrate into their primary development assignments activities that can mitigate the effects of future disasters.

It is important to note that this is an introductory training module. Trainees will learn what activities should be carried out but not necessarily how to do them (i.e., how to build a hurricane resistant house, how to run a health surveillance program, or how to identify what crops are resistant to floods).

It must be emphasized at the outset that even experienced trainers will need to invest a significant amount of time in preparation for this training module. In addition to the supplemental trainer references provided, trainers are strongly encouraged to conduct research and interviews that will enable them to make this generic training module country-specific.

The materials have been written for pre-service training. It is recommended that the training be carried out approximately two-thirds of the way into the training program when the trainees have gained some insight into development. This will allow them to place disasters in the proper context. Also, trainees will have time later in their technical training program (i.e. housing, health, agriculture, small businesses, etc.) to explore with their technical sector trainers specific mitigation activities that can be incorporated into their future assignments. Resource materials are included with this manual which the trainer should photocopy and give to the PCVs according to their specialty and/or their locale.

This training module may also be used for in-service training of PCVs at any point during their service.

ACKNOWLEDGEMENTS

The design of this training manual is largely based on the Peace Corps Training Manual, "Bureaucratic Effectiveness and Working With Counterparts", designed and written by Dick Vittitow and Jan Elster.

Further guidance was provided by Linda Spinks of the Peace Corps Office of Training & Program Support and by our Contract Manager, Pat Riley.

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PART I

DESCRIPTION OF THE MODULE

INTRODUCTION

This training module has been developed especially for Peace Corps trainers overseas. It sets out step-by-step procedures for conducting a two-session introductory training program about natural disasters and their effects on development. Trainers should familiarize themselves with the structure, style and content of the sessions and review the various handouts.

The module will use four methods to provide the trainees with a fundamental awareness of natural disasters and the roles Peace Corps Volunteers can play:

--- lecturettes;
--- a fictional case study/play;
--- structured group discussions; and
--- handouts of printed reference materials.

STRUCTURE

The two sessions described herein can be completed within approximately 3 hours; however, it is suggested that the time allotted for group discussions be expanded, if possible, to allow for full exploration of the concepts and issues raised. The sessions may be presented consecutively with a break between each session or may be given on two consecutive days. The latter format is preferred because it allows the trainees time to process and reflect upon the information presented during the first session.

The two sessions are:

1. Introduction to Natural Disasters, and

2. The Role of Peace Corps Volunteers in Disaster Mitigation and Preparedness.

Before you present the module, become thoroughly familiar with the play, the exercises, supplemental readings and handouts so that you have achieved mastery of the contents and process. You may need to adapt the script of the play to your own words so that your presentation is comfortable.

The module contains Supplementary Trainer References and Participant Handouts on natural disasters, key concepts, terms, and other important information about disasters and development. Read them before you delve into the sessions themselves. If additional trainers will be running any of the sessions, ask them to also read the materials so that you have some common ground in your knowledge of disasters. Keep in mind that these readings represent only a basic overview of the topic and are not meant to make you an "expert". Seek further resources if a certain subject interests you or you need more background.

TAILORING THE SESSIONS

The module has been designed for use by trainers in the Inter-American and NANEAP regions (excluding North Africa and Nepal) in general. The key to making the sessions geographically and technically specific and appropriate is to tailor the information so that it corresponds to the host country and specific sectors of concern to the trainees. For example, it is important for you to identify the specific natural hazards your country experiences and the disaster preparedness and mitigation activities currently being undertaken, especially in the sectors of interest to your trainees. There are many opportunities throughout the sessions to incorporate country-specific information, history, opinions, trends and cultural aspects. Some effective means of doing this are as follows:

- Review the sessions with host country disaster specialists. For example, you may want to interview someone in the Disaster Preparedness Office or national Red Cross about specific hazards and the disaster history of the country. Ask about any disaster plans they may have and whether they envision the use of PCVs during a disaster.

- Interview the Peace Corps Country Director and inquire as to his/her plans for PCVs should a disaster strike (both to protect and assist the PCVs and to determine what agreements the Director may have made with host country officials for the use of PCVs during a disaster).

- Invite host country nationals involved with disasters to attend the sessions and include them in the dialogue or as actors/readers in the play. Local technical experts can be very helpful. For example, a local geologist could give an additional lecture about earthquakes and their history in the country.

- Ask language and culture teachers to integrate the topics covered in your sessions into their classes. Most countries will have their own folklore about disasters -- e.g., where earthquakes come from or how to tell when a hurricane is coming. Disasters may also have affected the history of a country (for instance the relocation of the capital city, the death of an important leader, etc.).

- Ask technical teachers to integrate the topics covered in your sessions into their technical sessions. Health trainers, for example, could teach a class on health needs after a disaster.

However you decide to incorporate the people, ideas and information of the host country, remember that doing this is the key to making these materials appropriate and specific for the PCVs.

TRAINING CO-TRAINERS

One trainer can conduct the principal exercises of this module. However, in order to monitor small group work and to have others to help with materials and handouts, it is a good idea to train or orient at least two backup people. Alternatively, you may want to share the "lead trainer" responsibility with another trainer. However, if you decide to do this, ensure that all staff members understand their responsibilities, whether they are to lead sessions, to monitor groups, to prepare handouts or to act as resource persons. It is up to you to determine these roles and to ensure that the individuals involved are thoroughly familiar with their assignments.

Hold a brief staff meeting at the end of the first session to discuss the following topics:

--- Feedback for trainers and "actors" (what he/she did well or poorly);

--- Achievement/non-achievement of workshop goals;

--- Problems, special issues;

--- Review of the next session with your co-trainers and any host country participants that will be making presentations.

TRAINING TECHNIQUES

The following is a description of the training techniques required in the session. Refer to them later as you study how to run the respective exercises.

Structured Experience: Almost all of the activities in the module are structured exercises. A structured exercise is an experiential learning activity that is designed to achieve a certain purpose. Based on the theory that individuals learn most effectively by "doing", structured exercises are designed to allow the learner to participate in an activity. After a structured exercise you, as trainer, must allow enough time to help the participants in the "processing" stage. This is where you help them discover what they have learned so that they can place it into context and integrate it with their experience, in order for it to be applied in the future.

Processing: Processing is the technique of meshing new information with the body of knowledge and experience already existing. The role of the trainer is to assist the participants to see clearly what has been brought out in the sessions, discuss what they have learned, and verbally state how the learning can be used in their work. Each session is designed to use the following sequence:

1. Information is provided.
2. Participatory activity (the structured exercise) takes place.
3. Processing follows.

It is important that the processing stage never be omitted. Every exercise provides basic processing questions you can use. Your role is to ask questions, carefully listen to the responses, and help people come to conclusions about what they have learned.

In addition to developing questions that arise naturally from the presentations and information provided, you can also ask the participants:

--- What they learned.
--- What they discovered.
--- What they noticed.
--- What they realized.
--- How they can use this information/knowledge in their work place or community.

Encourage participants to respond with "I learned", "I discovered", etc. The key in processing is to ask open-ended questions that make people think about their responses instead of requiring a simple "yes" or "no".

Lecturette: A lecturette is a brief, carefully-prepared oral presentation of information. For example, an opening statement that explains what the group will be doing during the session or the topic that is to be covered is done in lecturette form.

Group Discussion: Group discussions are used to converse and deliberate about a topic under the guidance of a trainer/facilitator. This is the time for the individual participant to share his/her ideas and experiences.

ASSESSMENT

It is important to survey your sessions to determine the attitudes, needs and interests of your participants and to seek feedback on how they perceive the training they are receiving. The following (M 6-7) Assessment Form can be used to help you obtain this feedback. You may want to alter it to suit your needs by changing the questions to draw out information you specifically need or want. At the end of each session, ask the participants to fill out the form. From the responses you will be able to determine which methods are working and/or what needs to be changed for the next session. The participants do not have to sign their names.

M-6
Assessment Form

SESSION ASSESSMENT

PLEASE RATE THE SESSION USING THE SCALES PROVIDED AND ADD ANY COMMENTS.

1. Clarity of the objectives of the day's sessions:

1 2 3 4 5 6 7 8 9
Unclear — Very Clear

Because ____

____

2. Achievement of objectives:

1 2 3 4 5 6 7 8 9
Very Poor — Well Done

Because ____

____

3. Effectiveness of lead trainer:

1 2 3 4 5 6 7 8 9
Very Poor — Excellent

Because ____

____

4. Effectiveness of methods used:

1 2 3 4 5 6 7 8 9
Ineffective — Very Effective

Because ____

____

5. Usefulness of exercise sheets and handouts:

1	2	3	4	5	6	7	8	9
Not Useful								Very Useful

Because ____

____

6. Usefulness of the day's sessions to help you in your workplace or community:

1	2	3	4	5	6	7	8	9
Largely irrelevant to my work & life as a PCV								Highly useful for my work and life as a PCV

7. In the space below, write any comments or criticism you would like to give the staff as individuals or as a group.

____

____

____

____

____

8. What could have made these sessions more worthwhile for you in relation to the job you have in your workplace and/or community?

____

____

____

9. What specific sessions or activities did you find most helpful to you in your work and life?

____

____

____

SUPPLEMENTAL TRAINER REFERENCES

DISASTERS AND DEVELOPMENT

Disasters kill and injure people. They cause emotional stress and trauma. They destroy homes and businesses, damage agriculture, and disrupt both local and national economies. A natural disaster can happen anywhere, but for a combination of reasons -- political as well as geographic -- most large-scale disasters occur in the Third World. Natural disasters have significant impacts on the development of a country. If handled properly, they can provide many opportunities for the affected country. If handled incorrectly, they impose additional hardships on the victims and can reverse that nation's development. But it is the poorest who suffer the most, and the most basic issue in disasters and disaster response concerns their impact on the poor and the links between poverty and vulnerability to a disaster.

Until recently, the cause-and-effect relationship between disasters and the social and economic development of a society was ignored. Disasters were regarded as separate events to be handled in a distinct manner, and development organizations often tried to avoid becoming involved. But some unsettling facts began to emerge. Countries or communities on the road to development, experiencing a disaster, suddenly lost momentum. Resources became scarce, and development programs had to compete with relief and reconstruction for available funds.

At first it was assumed that the answer was more relief aid from the industrialized countries, and annually the appropriations grew. Yet material losses and numbers of people affected continued to increase. Perhaps the answer was to speed the response, to devote more resources, or to expand the international delivery system. These measures and others were applied but with few positive results. Why?

The basic problem was the failure to link disasters to development. The concept of a disaster as a separate event requiring a rapid response of medical and material aid was not entirely accurate and led to responses that were not only very ineffective but, in many cases, were counterproductive. Relief agencies tended to view disasters solely in terms of emergencies. They felt that the best way to respond was by providing emergency medical assistance, material assistance such as food, clothes and blankets, and temporary emergency shelter, usually tents. Emergency aid, collectively called relief, was distributed free, as a form of charity. Even if it were totally effective for meeting emergency needs, and even if it could be provided at an appropriate time, this response to disaster does not address the roots of the problem.

In order to provide truly effective assistance, it is first necessary to understand the nature of a disaster and to place it in a geographic context. A disaster should be defined on the basis of its human consequences, not on the phenomenon that caused it. An earthquake, for example, is simply an event in nature and even a very strong one is not a disaster unless it causes injury or destroys property. Thus an earthquake occurring in an uninhabited area (as do scores of tremors each month) is only of scientific interest and is not considered a disaster. While natural phenomena such as earthquakes, hurricanes and excessive rains can occur worldwide, their potential for widespread disaster is more a function of the ability of communities to cope with these events -- in terms of their social and economic systems as well as their physical structures -- than of the phenomena themselves.

When a natural event does affect a human settlement, the result may still not be a major disaster. Consider the earthquake that struck San Fernando Valley, California, in 1971. The quake registered 6.4 on the Richter Scale, yet the region surrounding San Fernando Valley (with a population of over seven million people) suffered only minor damage and 58 deaths. Two years later, an earthquake of a magnitude of 6.2 struck Managua, Nicaragua, and reduced the center of the city to rubble, killing an estimated six thousand people. What was the difference between the two locations that caused such a disparity and made one an "earthquake" while the other was a "disaster"? To oversimplify, the answer is the different level of development in the two cities.

Furthermore, the magnitude (deaths, damage, costs) of each disaster for a given developing country increases with the increased marginalization of the population. This is caused by a high birthrate and lack, or misallocation, of resources to meet the basic human needs of an expanding population. At the center of the resource issue are the parallel problems of land and economic opportunity. As the population increases, the good land in both rural and urban areas is taken up, and those seeking land for farming or housing are forced to accept marginal lands. These offer less productivity and a smaller measure of physical or economic safety.

Therefore, the root causes of disasters in developing countries are poverty and underdevelopment. Rapid population growth, urban migration, inequitable patterns of land ownership, lack of education, subsistence agriculture on marginal lands, etc., lead to vulnerable conditions such as unsafe siting of buildings and settlements, unsafe homes, deforestation, malnutrition, unemployment and underemployment, illiteracy, etc.

It is the interface between these vulnerable conditions and natural hazards such as an earthquake, cyclonic storm, drought, heavy rains, etc., that results in a disaster.

Deforestation of mountainous, desert and jungle regions can result from slash-and-burn, shifting agriculture and the cutting and gathering of woody plants as the main source of energy for cooking and heating.

Landslides or flooding disasters are closely linked to rapid and unchecked urbanization which forces low-income families to settle on the slopes of steep hillsides or ravines, or along the banks of flood-prone rivers.

Famines can be closely linked to shortages of purchasing power caused by rural unemployment or a sudden influx of refugees into a country from a strife-torn neighboring country.

The creation of drought conditions -- and the relative severity and length of time the drought lasts -- are significantly affected by poor cropping patterns, overgrazing, the stripping of topsoil, poor conservation techniques, depletion of both surface and subsurface water supply, and, to an extent, unchecked urbanization.

High numbers of deaths accompanying earthquakes almost always result from structural collapse of poor, low-cost houses.

Awareness of the development/disaster continuum is the first step in identifying opportunities for mitigation. Successful mitigation of disasters must be closely related to efforts that address the root causes of poverty and underdevelopment. Many mitigation activities either require a certain level of development as a precondition or are themselves development activities.

Disaster mitigation is the responsibility of all organizations working in threatened areas. It is within our capabilities today to reduce substantially the loss of lives and property resulting from every type of natural hazard. By understanding the elements and recognizing the threats of disasters, organizations can include remedial measures in many of their normal development activities at relatively little additional cost. Development organizations can take the leadership in mitigation efforts in housing, agriculture, economic development, urban and regional development, village planning, primary health, community organization, and others.

For example, earthquake losses are largely unnecessary and preventable. Approximately 90% of the loss of life in all earthquakes is the result of structural collapse. Until recently, this was unavoidable; but now that we know more about the nature of earthquakes and their effects, we have engineering techniques to make new structures reasonably earthquake resistant at a small additional cost, and are rapidly developing techniques to make older buildings safer. Even structures made of materials such as adobe and brick in the poorest settlements of the Third World can be made relatively safe, substantially reducing the loss of life.

As in the case of earthquakes, the majority of deaths in tropical cyclones are preventable. We can make houses wind resistant. We can give low-lying areas extensive protection from flooding. With simple planning, we can avoid areas vulnerable to the action of waves, erosion, flooding and mudslides. Even if hazardous areas must be occupied, there are measures we can take to reduce the vulnerability of people living in the structures and settlements.

The disaster event, its root causes and the havoc that it creates, form only one part of the picture. The ways in which organizations respond to disasters and the implications of that response for the development of the affected countries are also of major concern. Inappropriate responses, constituting a second disaster in themselves, occur frequently.

Recognizing poverty as the primary root of vulnerability and disaster in the Third World is the first step toward developing an understanding of the need for change in current disaster response practices. For if the magnitude of disasters is an outgrowth of underdevelopment and poverty, how can we expect to reduce the impact with food, blankets and tents, the traditional forms of assistance?

It is imperative that persons attempting to conduct a relief or reconstruction program be aware of the negative impact it may have. First, intervention can undermine the authority and prestige of local leaders and agencies. When a major relief program with resources of material, staff and equipment is established, it creates an instant alternative to local resources. If local leaders are not involved, their prestige may be affected and they may eventually lose authority. Local agencies with only limited resources can come to be perceived as ineffective.

Second, intervention can become a disincentive to self-help. In many communities, the expectation of aid has delayed reconstruction efforts. A recent study showed that when one village learned of massive relief efforts being undertaken in neighboring communities, it delayed initiating activities that the people were perfectly capable of undertaking themselves. In another example, a relief agency "adopted" a village to provide reconstruction assistance and ordered a halt to all self-initiated reconstruction activities until the agency could decide what it was going to do.

Finally, intervention can wipe out the development efforts of indigenous organizations almost instantaneously. One of the primary goals of development efforts is to encourage self-reliance on the part of the people. Yet a massive relief program that does not take development questions into consideration can create disincentives to self-reliance, can establish dependencies on outside organizations, and can foster doubts on the part of the people about their own ability to control their lives and destinies.

Relief and reconstruction programs, therefore, cannot be viewed or carried out as isolated or distinct operations. Many organizations, including some of the most progressive development groups, fail to make this connection and, prompted by the urgent post-disaster needs, concentrate their energies on rapid delivery of relief items. The approaches that they would normally use in development (such as extensive citizen participation, support of existing social systems, development of local initiatives, etc.) are all put aside in the belief that the disaster requires an immediate response and the development approach is too slow. Organizations that normally encourage "bottom-up" decision-making suddenly take on a "top-down" orientation.

But normal development approaches cannot be discarded in emergencies. Experience has shown that they must be used in developing and executing all relief and reconstruction projects. Agencies that have worked for years to develop leadership and to foster community participation in decision-making, but disregard the development approach in relief and reconstruction, can set back or even wipe out years of progress toward development.

Finally, what factors determine whether an intervention will be successful? Sensitivity to real needs, a high degree of participation by all relevant groups, availability of appropriate resources and technologies, preparedness, and timing actions to coincide with the right phase of the disaster are all important aspects. But the most important is consideration of what intervention will mean in terms of the long-term development of the society. Intervention should support the development process and encourage and strengthen local organizations. To do this, intervention must be based on a clear understanding of pre-disaster conditions and needs within the affected society. In this way, the response will be compatible with local resources, technical capabilities and lifestyles, and can be provided in such a way as to make a contribution to rapid recovery and an improved post-disaster standard of living. The role of intervenors is to support activities that local people and/or organizations cannot carry out themselves.

The above paper is reproduced from The Potential Contribution of Peace Corps to Disaster Preparedness in Africa, Briefing papers prepared by INTERTECT for the AID/Peace Corps Disaster Preparedness Conference, Mombasa, Kenya (March 1983). The material on which the paper was based is from Disasters and Development, Frederick C. Cuny, Oxford University Press, New York (1983).

KEY CONCEPTS

A. The Relationship of Various Disaster Activities to the Appropriate Time Phases

All disaster-related activities are divided into distinct time periods. The length of time any one period will last can vary greatly depending upon the type of disaster and other factors. It is important that people involved in disasters recognize the different phases and the appropriate activities that occur in each phase. For example, many emergency activities involve the distribution of free relief supplies. If this activity is carried on in the later phases (e.g., during reconstruction), there is a danger that dependency relationships can be established, and the relief may provide disincentives to agricultural or economic recovery.

In general, disaster activities can be divided into three broad categories: pre-disaster, emergency response, and post-disaster recovery activities.

1. Pre-disaster activities. These activities are normally subdivided into disaster prevention, disaster mitigation and disaster preparedness. In general, disaster prevention is event-focused. In other words, the objective of prevention is to prevent the disaster from occurring at all. Disaster mitigation accepts the fact that some natural event may occur but tries to lessen the impact by improving the community's ability to absorb the impact with little damage or disruptive effects. Disaster preparedness assumes that the disaster will occur and focuses on structuring response and laying a framework for recovery.

2. Emergency response activities. Emergency response activities are those carried out during the actual emergency or immediately prior to it. This may involve evacuation of threatened communities, emergency assistance during the disaster, and actions taken in the immediate aftermath during the time when the community is rather disorganized and basic services and infrastructure are not fully functioning.

   Because the emergency period is both dramatic and traumatic, most attention by the press and international community is focused here. Yet in most disasters (with the exception of droughts and civil strife), the emergency passes rather quickly and, in reality, only accounts for a very small percentage of the total picture.

3. Post-disaster activities. Post-disaster recovery can be subdivided into two phases. The first begins at the end of the emergency phase and is a transitional phase (often called the rehabilitation phase) when people and community systems try to re-establish a semblance of normalcy. This period is usually characterized by such activities as businesses reopening in damaged structures, farmers returning to reclaim and clear their land, and resumption of basic infrastructure services such as water and sanitation systems in urban areas.

   The reconstruction phase is marked by large-scale efforts to replace damaged buildings, revitalize economies or restore agricultural systems to their full pre-disaster production capacity.

B. The Relationship of Various Time Phases to Each Other

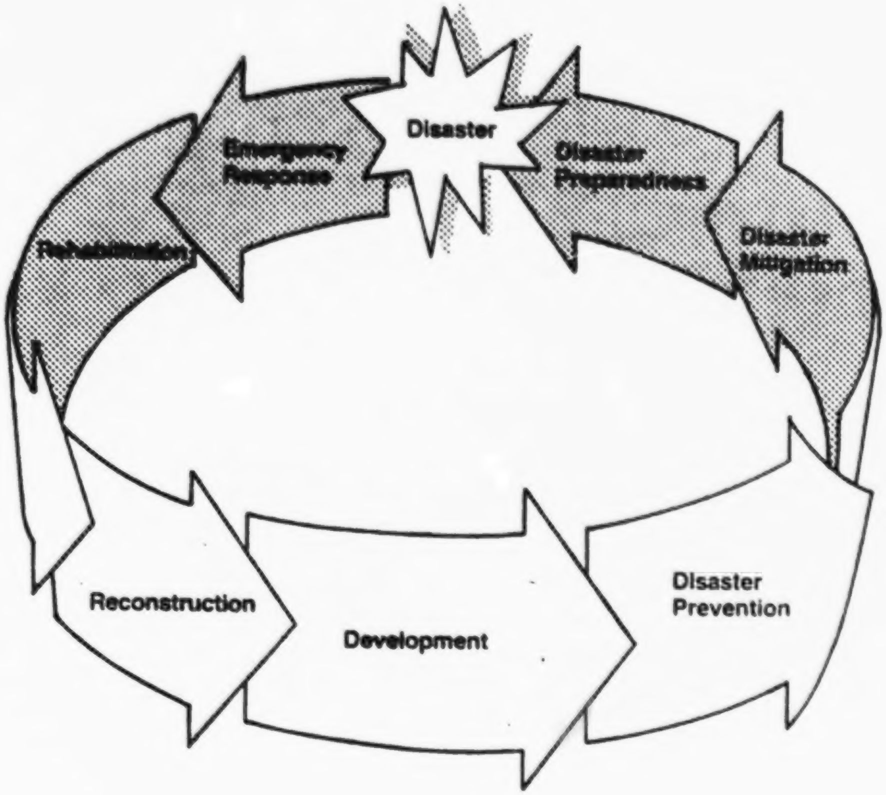
The activities that are carried out to mitigate a disaster closely resemble the activities that would be carried out during reconstruction. An observer will also notice that the activities carried out in both these phases are essentially development activities as they not only reduce the disaster impact but also provide economic or social benefit. By understanding how these activities relate to each other and to development, one can see where Peace Corps activities can play an important role in disaster mitigation and response.

C. How Activities in One Phase Should Set the Stage for the Next

Referring to the disaster continuum illustrated on the next page, it is possible to see how activities in one phase relate to the preceding and following phases. For example, emergency response can be facilitated if the operations have been planned prior to the disaster, not during it. As a general rule, you should remember that each phase and each activity of a disaster lays the framework and sets the stage for activities in the next phase. Therefore, when planning an emergency response, you should keep in mind how that activity can help promote faster recovery. A simple example would be as follows. If a house has been destroyed in a windstorm or flood, there are several options for providing shelter during the emergency. You can provide a tent, which will offer shelter, or you can provide building materials that can be used to build a temporary shelter and then re-used in a permanent house during reconstruction. The tent solves one need during one phase; the building materials solve needs in the emergency phase and set the stage for reconstruction.

D. Understanding the Relief System

An important aspect of understanding disasters is learning how the relief system is organized and how it functions. To someone who


Disaster
Emergency Response
Rehabilitation
Disaster Preparedness
Disaster Mitigation
Reconstruction
Development
Disaster Prevention

DISASTER CONTINUUM

has not experienced a disaster before, the myriad organizations that are involved in each of the different phases can be confusing and frustrating. It is important to try and learn which organizations respond to different types of disasters, how they relate to the overall picture, and what the role of various individuals and organizations is in relation to the host government and to the stricken communities. It is not unusual to find that the majority of responding organizations are not professionally trained to deal with disasters. They rely heavily on volunteers or short-term staff, many of whom have had no prior experience or even briefings on what to expect.

It is also not unusual to find that the majority of agencies focus primarily on the emergency period and not on pre-disaster activities or longer-term recovery activities. Furthermore, many of the people who will be in charge will be development personnel like PCVs who have been "drafted" into relief service. This is the nature of the relief system: a few specialists trying to marshall a large corps of volunteer and short-term personnel to deal with the major issues. Knowing who is responsible for what and how the system works can greatly facilitate things for PCVs, should they be pressed into service.

E. Understanding Peace Corps' Role Within the System

Peace Corps is not a relief agency but by its very nature PCVs in each country have a variety of jobs and diverse backgrounds, many of which can be useful in a disaster. Unlike voluntary agencies or agencies within the U.N. system, Peace Corps runs no development programs or projects per se. Therefore, in most disasters, Peace Corps Volunteers will be called on to use their unique skills in conjunction with the activities of other organizations. While some PCVs may be asked to help develop preparedness or mitigation plans, or may be involved at the national level in planning for disasters, it is unlikely that Peace Corps would be asked to do more than provide individuals to fill positions in a relief organization. In most assignments, PCVs will work as they do now at the community level to demonstrate or teach specific skills to help people cope with the disaster. The most valuable roles that Peace Corps will play will be in the mitigation and reconstruction phases. These are essentially development activities and are the most valuable input that Peace Corps can make. It should be remembered that, for the most part, development is the best disaster mitigation.

This paper is taken from "Introduction to the Briefing Papers: Key Concepts", The Potential Contribution of Peace Corps to Disaster Preparedness in Africa, Briefing papers prepared by INTERTECT for the AID/Peace Corps Disaster Preparedness Conference, Mombasa, Kenya (1983).

ORGANIZATIONS INVOLVED IN DISASTER ASSISTANCE

When most people think of disasters, the image that springs to mind is one of voluntary agencies or the Red Cross providing emergency relief materials and aid to the disaster victims. While this image is, in part, correct, it only depicts a small portion of the assistance that is provided and the manner in which it is delivered. In this briefing paper we will explore the full range of disaster assistance and identify the types of organizations and the way in which disaster assistance is (or should be) provided. After reading this paper, it should be clearer how Peace Corps Volunteers, as development workers, could become involved in the various phases of each type of disaster. It is important to know what type of organizations are normally assigned disaster responsibilities and the specific organizations that become involved in each phase.

The Role of the Government

The ultimate responsibility for natural disasters lies with the national government of the affected country. Responsibility for disaster mitigation is usually assigned to a government ministry. For example, mitigation activities for drought would normally be assigned to an agricultural ministry, while mitigation and preparedness activities for earthquakes would normally be assigned to a housing or public works ministry.

Preparedness planning is usually assigned to an interministerial committee or a specialized unit of government that focuses on planning and coordination. This may be a new preparedness group or an existing planning group such as a central planning office.

During an emergency, it is not uncommon for the disaster preparedness authorities to assume responsibility for coordination of emergency activities. Depending on the type of disaster, however, operational responsibilities will again usually be assigned to one or more ministries, usually those with some degree of operational capability or with special equipment required for the emergency period. For example, public works departments, which have trucks and engineering equipment, are often assigned lead responsibility during floods, while public health departments are usually assigned lead responsibility during famines or epidemics.

During the post-emergency phases and especially during reconstruction, operational responsibility may be shifted to another government ministry or combination of ministries. If the disaster has been particularly destructive or widespread, sometimes special regional agencies may be formed with staff seconded from the normal ministries. These regional agencies tend to remain in existence for about 5 years and then are disbanded and the personnel re-absorbed into their former jobs.

Foreign Assistance Patterns

Foreign assistance patterns vary according to the phase and type of disaster. While many international development agencies participate in development activities that might mitigate disasters, few would see this as their primary role. Likewise, few participate in disaster preparedness planning.

During the emergency non-governmental organizations often become prominent in dispensing emergency relief. In general, non-governmental organizations should be regarded as specialized service agencies; that is, they have special skills or interests that are generally sector-focused. They usually provide assistance for only limited periods of time (due to the nature of their funding which is dependent on public support and interest in a particular disaster). Voluntary agencies tend to work in person-to-person-type activities and generally prefer to do small-scale, short-term projects rather than long-term activities that require large capital expenditures. In order to make the most of scarce resources, governments often prefer to turn over large segments of humanitarian efforts to these agencies so that governmental resources can be channeled into longer-term and more expensive recovery activities. Because voluntary agencies work directly with the disaster victims, they tend to be highly visible; but to believe that they are responsible for the majority of disaster relief is erroneous.

During reconstruction, international development agencies may also become involved. This is because many reconstruction activities involve development work, and many agencies recognize that the reconstruction period offers opportunities for advancing development goals during reconstruction.

Major foreign governments usually have a greater interest in disaster mitigation and preparedness than non-governmental agencies, and most of the work in these activities has been stimulated by groups such as the Office of U.S. Foreign Disaster Assistance (OFDA) of the Agency for International Development (AID). Foreign governments usually provide bilateral assistance directly to the host government and may provide technical assistance for planning or financial assistance for implementation.

When a disaster occurs, foreign governments may provide assistance by several different methods including: bilateral assistance directly to the government for general support or specific projects, multilateral assistance through international organizations (such as the United Nations or various regional groups), or funding to voluntary agencies to conduct specific projects.

The pattern of aid established during the emergency will usually carry over into reconstruction. But generally, emphasis on voluntary agencies is replaced with more bilateral assistance directly to the government and its ministries. Technical assistance for project administration and planning is also a popular form of aid.

The United Nations system is another major source of international aid for disasters. The United Nations Development Programme (UNDP), the Food & Agricultural Organization (FAO), and the United Nations Centre for Human Settlements (UNCHS) are the principal U.N. agencies actively engaged in disaster prevention programs.

Preparedness activities fall under the domain of the United Nations Disaster Relief Office (UNDRO). UNDRO normally works through the UNDP resident representative (Resrep) in each country to provide planning assistance for disaster preparedness. This assistance is usually in the form of technical assistance and studies designed to help the government structure its emergency response.

During an emergency many different United Nations agencies may respond. UNDRO often sends a representative to help coordinate foreign donations, and, if requested by the government, may stay on for several additional weeks to report on emergency needs and response to those needs by external donors.

The United Nations specialized agencies may also respond with emergency assistance. UNICEF often initiates programs for women and children, and in droughts the World Food Program (WFP) provides emergency rations to augment available food supplies. Most emergency assistance is provided as "project aid" by the UN agency using its own staff and locally hired personnel. The United Nations agencies have tremendous logistical capabilities and can undertake emergency projects on a vast scale.

During the post-emergency phases, the United Nations development agencies often take a lead role. The FAO is usually very active in agricultural recovery activities, while the UNDP and UNCHS become involved in physical reconstruction of houses and basic infrastructure. Assistance in the later phases, however, is usually in the form of cash and technical assistance, not operational projects.

The Red Cross system (or Red Crescent in Moslem countries) can also bring many resources to bear in an emergency. The Red Cross/Red Crescent society in each country is usually chartered by the government and given semi-official status. Each national society, in turn, belongs to the international League of Red Cross Societies (LRCS) to which they can turn for additional foreign assistance should it be required.

The Red Cross/Red Crescent is primarily concerned with emergency operations and the vast majority of their activities involve preparing for, and responding to, an emergency. Ideally, the national society will have many regional and local chapters, all of which have undergone some form of emergency training. In many cases, these are supported by a system of national emergency supplies that can be quickly augmented from international stockpiles maintained by the LRCS.

Because the primary focus is on emergency humanitarian assistance, most of the aid provided is "in kind", or material. The LRCS also provides technical assistance to national societies in preparedness planning.

Assistance Models

The term "victim" is non-specific. It encompasses everyone, and it obscures the fact that each disaster affects a specific group in a population more than others. For example, droughts affect farmers and pastoralists more than others. Earthquakes affect people living in poor quality, non-engineered houses. In every type of disaster, specific groups of potential "primary victims"* can be identified (as shown in columns 1 and 2 of Table 1). The characteristics of these groups provide a key to determining the kind of assistance that is appropriate during each phase of a disaster and give an indication about how the assistance should be delivered.

Disaster assistance is concerned with 2 types of aid: relief (which is designed to reduce suffering and to replace losses) and long-term assistance that might be called change-related aid. The objective of the latter is to encourage people to change their normal habits or practices to reduce vulnerability to a disaster or to make sure that a disaster does not recur.

Knowledge of the characteristics of the victims enables us to plan for both types of assistance. Relief is the easiest. Again, let's take droughts as an example. Farmers (especially marginal, subsistence farmers) will be prominent primary victims. In an emergency, they and their families will need food and alternative sources of income until they can replant and harvest a normal crop.

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* Primary victims are persons affected by the immediate consequences of a disaster. For example, farmers would be primary victims of droughts. Secondary victims are those residing within the affected area or on the border of the area who suffer economic loss due to the disaster. One example would be small store owners within the disaster area who are not able to sell their goods because of the lack of cash on the part of primary victims.

Therefore, the relief program must have a feeding component, and a long-term assistance component in the form of social services to help the families find other means of supporting themselves until the emergency has passed and they can replant.

Knowing that primary victims are farmers also helps us to plan disaster mitigation and reconstruction programs. Both activities require that people change some aspect of their normal way of doing things. In disasters, change can be brought about in one of three ways: through public awareness, in other words by providing people with information so that they will act on their own; through legal measures, i.e., by forcing people to change by law; or through extension and education, i.e., by demonstrating and teaching alternative methods and supporting these with a variety of services.

In our drought example, if we know that the target audience consists of farmers, mitigation measures will involve changing crops, cropping patterns or agricultural practices. This will require demonstrations, technical assistance and extensive people-to-people contact. We also know that public awareness and legal methods will have little impact on changing agricultural patterns; therefore, the assistance model for mitigation and reconstruction must be one that is based on extension.

Table 1 identifies the primary victims in each type of disaster and lists the disaster assistance program models that should be used in each type of disaster. Comparison of column 3, "Pre-disaster Assistance Models", and column 5, "Post-Disaster Assistance Models", shows that both borrow heavily from normal development methodology. By understanding these links, PCVs will be more effective participants in both disaster and development activities.

Adapted from "Assistance Models", The Potential Contribution of Peace Corps to Disaster Preparedness in Africa, Briefing papers prepared by INTERTECT for the AID/Peace Corps Disaster Preparedness Conference, Mombasa, Kenya (March 1983).

Table 1:
DISASTER ASSISTANCE PROGRAM MODELS

Type of disaster 1	Primary victims 2	Predisaster Assistance Models 3	Emergency Relief Models 4	Post-disaster Assistance Models 5
Droughts	Farmers	Agricultural extension, water resource development	Alternative income, food	Agricultural extension
	Herdsmen	Husbandry extension	Emergency fodder distribution	Husbandry extension
	Nomads	Husbandry extension	---	Husbandry extension
Earthquakes	Persons in low quality housing	Housing education to public & contractors	Economic assistance, material aid	Housing education to public & contractors
Famine	Women & small children, elderly	Nutrition education	Selective feeding, general rations, horticultural extension	Nutrition education, selective feeding
Floods	Farmers, urban	Planning, land reform housing education	---	Planning, land reform, housing education
Hurricanes	Farmers, occupants of low quality housing	Agricultural extension, housing education	Economic assistance, material aid	Agricultural extension, housing education
Insect infectation	Farmers	Agricultural extension	Agricultural extension	Agricultural extension
Epidemics	Small children	Immunization, environmental sanitation	Medical relief	Immunization, environmental sanitation

APPROPRIATE ROLES FOR PEACE CORPS VOLUNTEERS IN MITIGATING, PREPARING FOR AND RESPONDING TO DISASTERS

As more poor communities are built in vulnerable environments, Peace Corps is developing a broader understanding of the development-disaster-development continuum and is identifying appropriate roles for Peace Corps Volunteer (PCV) involvement. There are many disaster related roles that PCVs can fulfill and activities they can undertake that are consistent, compatible and even integral with their ongoing development projects. With adequate additional training, the PCVs' special blend of language, cultural and technical skills, along with a commitment to live and work at the community level, will allow them to make significant contributions in reducing community vulnerability to extreme natural phenomena as well as in post-disaster recovery.

Disasters are not unforeseen events, and the knowledge now exists that would allow PCVs to identify the hazards that threaten a community, to estimate the areas and population groups that will be most affected, and to substantially reduce or mitigate their impact. At the most basic level, PCVs can promote public awareness of natural hazards and public action to prepare for an impending disaster and, if necessary, to plan for the effective application of aid. Second, PCVs with technical skills (i.e., engineering, forestry, nutrition, agriculture, etc.) can work with local community groups and leaders on long-term development projects to reduce the physical vulnerability of structures and settlements; PCVs with community organizing skills can work to strengthen the social structure of a community and increase self-sufficiency and reliance on internal resources to improve the ability of local people to cope with disasters. Third, PCVs can play a clear role in pre-disaster surveillance as part of an "early warning system" and in post-disaster monitoring of local conditions in collaboration with national and international agencies.

Peace Corps Volunteers have a unique role to play as intervenors because, unlike most other intervenors, they live and work at the community level, know the language and understand the pre-disaster conditions and needs within the affected society. They are familiar with the important community structures and indigenous coping mechanisms in a culture such as basic family structure, economic patterns, governmental structure, religious affiliations, customs and practices, and power relationships.

In contrast, few intervenors are familiar with the development issues within a community prior to their intervention. By failing to understand the basic elements of each community activity, an outsider may respond inappropriately and delay or prevent a return to normal. Typical problems that inhibit disaster response include lack of familiarity with the victims' culture and available resources, and language barriers. A housing reconstruction program, for example, requires a broad understanding of housing, not simply in terms of the buildings but as a process consisting of a blend of labor, skills, capital, financing, settlement patterns, culture, status, environmental protection, and traditions, as well as its forms and structures. There are many examples of houses built by relief agencies that have been rejected outright by the victims, or that are actually less safe than the pre-disaster structures (due to improper design or construction).

The Peace Corps approach to development is firmly rooted in the belief that a high degree of participation by all relevant groups is essential to the creation of self-sufficiency. Furthermore, Peace Corps promotes use of locally available resources, appropriate technologies, institution-building, counterpart training, technology transfer, community organization, etc., and discourages dependency. Experience has shown that this same philosophy is the most effective approach for disaster intervention that will genuinely reduce vulnerability before a disaster or make a post-disaster contribution to rapid recovery and an improved standard of living.

Furthermore, PCVs believe in the philosophy that people are not objects to be acted upon by others, but have the right to determine their own lives, their culture, traditions, values and lifestyles. A major concern among disaster experts today is the lack of accountability by the majority of intervenors. An agency that simply gives away material goods already collected and delivered is not likely to be overly concerned with developing a program with full and meaningful participation. Short-term relief agencies enter a community, distribute their aid, and withdraw within a matter of weeks, never taking the time to assess the quality of their aid or its impact. Again, in contrast, PCVs will still be in their affected communities long after most intervenors have gone.

PCVs can also help communities develop local preparedness plans. Preparedness can save lives and help reduce the incidence of suffering following a disaster, and can shorten recovery time. Our increased understanding of disaster response by societies indicates the need for decentralized community-based preparedness activities. Preparedness plans for a small community may consist of no more than a brief checklist and description of activities with the assignment of response noted on the margin. Any preparedness activity, no matter how small, can have significant results. Decentralization is important because it allows for local variations in culture, community and need.

With appropriate assistance from PCVs, disaster preparedness measures can be undertaken with the skills that are available within the community and with local technological resources. The most vulnerable areas and population sectors can be identified, contingency plans can be developed, and plans can be drawn outlining the actions to be taken by all concerned. Where necessary, supplies or materials can be stockpiled.

Experience has shown that assistance provided by international relief agencies rarely plays a major role in the actual emergency phase. PCVs that are already on-site and who are properly trained can make positive contributions in support of actions taken by the affected community itself. Volunteers should be made aware of the specific issues related to the emergency phase and the appropriate steps to be taken. Basic first-aid skills may help during the first 48 to 72 hours.

Finally, PCVs can play positive roles in long-term reconstruction. Reconstruction operations conducted and properly executed by PCVs within the context of development can provide a strong stimulus to recovery and a base for positive change.

Disasters often precipitate dynamic social and economic change, and intervention by PCVs can play a part in shaping that process by providing expertise and resources not otherwise available, especially at the local community level, at key points during the development-disaster-development continuum. Intervention can support coping mechanisms rather than impeding or harming them. Resources and new opportunities can strengthen existing institutions or create needed new ones and help them better serve the community.

This paper is from The Potential Contribution of Peace Corps to Disaster Preparedness in Africa, Briefing papers prepared by INTERTECT for AID/Peace Corps Disaster Preparedness Conference, Mombasa, Kenya (March 1983)

	PEACE CORPS SECTORS				
Disaster cycle elements	Agriculture/ Forestry	Nutrition/ Health	Community Development	Education	Institutional Development
Hazard analysis					
Geological	x				
Meteorological	x				
Hydrological	x				
Environmental	x	x	x		
Epidemiological		x			
Vulnerability analysis					
Structures and Infrastructure	x		x		x
Adjustments					
Cropping patterns	x				
Health conditions		x	x		
Preparedness					
Organization					x
Legislation					x
Planning	x	x	x	x	x
Education/training	x	x	x	x	x
Mitigation					
Risk reduction	x	x	x	x	x
Prevention					
Land use	x		x	x	x
Physical adjustments	x		x		
Prediction and warning					
Technology					
Interpretation	x	x			
Decision-making					x
Communications					
Public response	x	x	x	x	x
Relief					
Mobilization		x	x		
Assessment	x	x	x	x	x
Coordination	x	x	x	x	x

	Agriculture/ Forestry	Nutrition/ Health	Community Development	Education	Institutional Development
Relief (cont'd.)					
Resource analysis	x	x	x	x	x
Procurement					
Logistics	x	x	x	x	x
Reporting	x	x	x	x	x
Reconstruction					
Incentives/ Disincentives	x		x		x
Development Strategies	x	x	x	x	x

Source: Frederick Cole, OFDA.

SOLOMON ISLANDS DISASTER EXPERIENCE PROFILE

DISASTER TYPES

Earthquakes, hurricanes, tsunamis, and volcanic eruptions.

HISTORY

Lack of information, particularly during and immediately following the war years, precludes any possibility of dealing fully with hurricanes in the Solomon Islands. The following listings are therefore incomplete.

Hurricanes, 1800-1900 (Visher)

1840, December - hurricane: west of Solomons, near east coast of New Guinea.
1880, January 20 - hurricane: near Savo.
1890, March 3 - hurricane: southern end of the Solomon Islands.
1891, March 4-12 - hurricane: Santa Cruz Islands, east of Solomon Islands, then to Vanuatu.

Notable Storms since 1951 (OFDA, Disaster History)

1951, March 24-25.
1952, January 23-24 - developed south of the Solomon Islands but caused much damage from high seas.
1955, March 23.
1959, March 7-8 - south of main islands.
1959, December 20-22 - severe at Choiseul Bay.
1966, March 28 - "Glenda": widespread damage in Guadalcanal and San Cristobal, mostly from high seas.
1966, November 14 - "Angela": small, violent cyclone over Malaita and Guadalcanal; caused extensive damage.
1967, November 11-12 - "Annie": caused widespread and heavy damage especially in the more western islands; winds of 100 mph.
1968, December 11-12 - "Becky": widespread damage in central islands, especially Malaita and San Cristobal.
1971 - "Ursula": violent over Santa Anna, 1 dead, 2,500 homeless.
1972 - "Carlotta": loss of lives, serious damage to buildings and agricultural areas.
1972 - Hurricane "Ida": destroyed valuable timber.
1979, February 20 - "Kerry": affected eastern Solomon Islands; 6,000 homeless, 2 dead, and several seriously injured.
1982, April 2-4 - Cyclone "Bernie": winds of 35-40 knots and gusts of 70-75 knots; heavy surf and falling trees caused much damage.

Other Types of Disasters

Earthquakes: The Solomon Islands lie in a seismically active region. There were serious earthquakes in 1959 and 1977 which produced landslides, flooding, and tidal waves in the South Guadalcanal area, the last one resulting in 13 deaths. Earthquakes occurred on 7 July 1977 (epicenter 160 km. southwest of Bougainville, with a force of 7.3 on the Richter scale); 4 November 1978 (epicenter 320 km. south of Guadalcanal, 7.5 R.); 8 July 1980 (near Santa Cruz Islands, 7.3 R.); and 9 July 1980 (in the Santa Cruz Islands, 6.8 R.).

Volcanoes: There are four volcanoes: one on the island of Savo which erupted in 1840 (1852?); one on the island of Simbo; a submarine volcano Karachi; and Tinakula in Santa Cruz which erupted in 1971. In the 1971 eruption, lava poured for two months, leaving 6,000 homeless and causing extensive damage, including the loss of the San Cristobal bridge.

Tsunamis: The earliest record of a tsunami was in 1899 when many beach houses were washed away. In 1926, a tsunami in Guadalcanal inundated the port and island with waves of 2-6 m.; in October 1931 a tsunami destroyed 18 villages and killed 50 persons; in April 1939 a tsunami killed 12; and in 1960 an earthquake in Chile caused a tsunami which damaged the wharf.

DESCRIPTION OF TROPICAL STORMS AND HURRICANES, 1950-1969

(taken from Kerr, pp. 101-103)

January 1952

This cyclone developed south of the Solomon Islands on or before January 23. That night and throughout the next morning the southeastern Solomon Islands were battered by what the Pacific Islands Monthly called a young hurricane. Trees and power and telephone lines were brought down and many roofs were damaged. However, most of the damage was caused by the tremendous seas. The last of Honiara's three wartime jetties was battered to pieces, mission buildings and a pontoon jetty at Tulagi were demolished, and many coastal villages on San Cristobal and Ysabel were inundated.

March 1966: "Glenda"

On March 28 when the center of "Glenda" was more than 100 km. to the south, wind gusts were reaching more than 75 knots. On Russell Island 250 hectares of the coconut plantation were completely destroyed. The cyclone caused widespread damage in Guadalcanal and San Cristobal, mostly through the action of the sea. The wharves at Honiara were damaged and a nearby fishing village was flattened. From the Solomons, "Glenda" moved southward through the Coral Sea and claimed the lives of six men in two separate marine accidents.

November 1966: "Angela"

"Angela" was a small but vicious tropical cyclone which moved southwestward over Malaita and Guadalcanal on November 14. Thousands were left homeless on the two islands. There was extensive damage to coconut and cocoa trees and many village market gardens were destroyed. Three people lost their lives.

November 1967: "Annie"

Wind, flood, and sea caused widespread and heavy damage, especially in the more western islands of the group. The Louisiade Archipelago and the Milne Bay area of Papua were also lashed by the storm. More than a dozen people lost their lives.

December 1968: Becky"

For the third year in succession, widespread damage was caused by a cyclone. This time the central islands, particularly Malaita, and San Cristobal suffered most. At Auki (Malaita) it was reported that gusts speeds reached 72 knots. At Kira-Kira the roof was blown off the Government store and the market building was destroyed. Seven school buildings were destroyed on Ugi Island, and flooding in parts of Malaita left 200 people homeless. One woman was killed and several persons were injured.

April 1982: "Bernie"

The first notice of cyclone "Bernie" was at 2:00 p.m. on April 1, when the government's patrol boat "Tulagi" recorded a big drop in pressure while cruising off Lord Howe Island. With a destructive circumference of 160 km., the cyclone swept across Ontong Java and hit Santa Isabel at 6:00 a.m. on April 2. The cyclone's zigzag path took it from Ontong Java across Santa Isabel, through Russell Island, and across the west coast of the largest island in the group, Guadalcanal, into the Coral Sea. Winds up to 80 knots were recorded and they were accompanied by 8 m. waves. (Post Courier, 7 April 1982, p. 5)

RESPONSE PATTERNS

Unknown.

SOLOMON ISLANDS PREPAREDNESS AND REHABILITATION PROFILE

DISASTER PLANNING

On June 12, 1980 the Cabinet approved the Solomon Islands National Disaster Plan. Each of the six provinces has its own disaster plan. Elements of the governmental structure and organization are involved at both levels; therefore, the efforts of the National Government and Provincial Governments are automatically integrated to a considerable degree. In most forseeable circumstances, a provincial plan is likely to be invoked first, with the National Plan being activated, either partially or fully, to give support.

The Ministry for Home Affairs and National Development (MHA) has overall responsibility for natural disasters and emergencies in the country. The National Disaster Council (NDC), whose chairman is the Permanent Secretary, Ministry of Home Affairs and National Development, is responsible for organizing and implementing disaster preparedness and responses as well as coordinating the National Disaster Plan with Provincial Disaster Plans. The Commissioner of Police is the Disaster Operations Coordinator (DOC) and is responsible for implementing policy decisions along the guidelines issued by the National Disaster Council.

The Royal Solomon Islands Police Force provides Disaster Operations Coordinators at both national and provincial levels, and police facilities are utilized as Emergency Operations Centers.

WARNING SYSTEMS

The Ministry of Transport and Communications provides warning of storm and cyclone activities and issues weather warnings to ships. The key principle is that the relevant information be passed as quickly as possible to the Chairman of the National Disaster Council, the Disaster Operations Coordinator, and/or any member of the NDC.

When a warning is issued, the stage of alert comes into being and provisions of the National Disaster Plan and/or Provincial Disaster Plans may have to be invoked. The Chairman of NDC will decide what action should be taken at this stage.

MITIGATION EFFORTS

Land-Use Planning: Unknown.

Building Codes: Unknown.

Architectural Development for Disasters: Unknown.

Infrastructure Development: This aspect is described in the Solomon Islands National Development Plan 1975-1979.

Education and Public Information: An essential adjunct to the National Disaster Plan is a limited program to develop public education and awareness, especially in the development of the concept of the "self-reliant community." The Ministry of Home Affairs is charged with investigating ways of extending the limited measures in existence, such as posters. Also, appropriate emphasis on disaster preparedness within the normal educational programs is the responsibility of the Ministry of Education and Training as requested by the Ministry of Home Affairs.

Training is required in the planning, organization, and management of efforts to counter disasters. Some training proposals for the Solomon Islands are:

a) post-disaster review at all levels;
b) one-day seminars for briefings and exchange of ideas and experiences, as a good means of reviewing aspects of the Disaster Plan;
c) police training;
d) training in schools (personal/family action, action if disaster occurs during school hours, etc.); and
e) education on developing a "self-reliant community."

ASSESSMENT

Initially the survey and assessment of a disaster is the task of provincial personnel, as directed by the Provincial Disaster Committee and carried out under the supervision of the Provincial Disaster Operations Coordinator. Further information is likely to come from local sources near the disaster area, especially through police channels.

The Ministry of Agriculture and Lands assists in damage survey and assessment as requested by the National Disaster Council, providing field survey teams, equipment, and communications. The NDC also provides for reconnaissance by air or, if appropriate, from the sea.

The information gathered is channelled through the Disaster Operations Coordinator, with an additional two-way information flow as necessary between NDC/PDC.

RELIEF AND REHABILITATION

The National Disaster Council is responsible for authorizing and arranging immediate relief measures, mainly in the form of sustenance, shelter, and medical aid, as well as temporary evacuation if necessary.

The NDC is also responsible for advising the Minister of Home Affairs on specific items of international aid which might be required, based on information received and assessment of the disaster.

The Red Cross and the Solomon Islands Christian Association assist in the provision of disaster relief as agreed upon with the NDC.

Rehabilitation is primarily the responsibility of the Ministry of Home Affairs working with other government departments, both national and provincial. It must cover such aspects as: relocation, administration of relief funds, allocation of financial grants, organization of long-term repairs, sociological effects, and assistance in future preparedness measures. If necessary, the MHA is authorized to utilize the NDC for policy aspects affecting rehabilitation.

RELATIONSHIP WITH DEVELOPMENT PLANNING

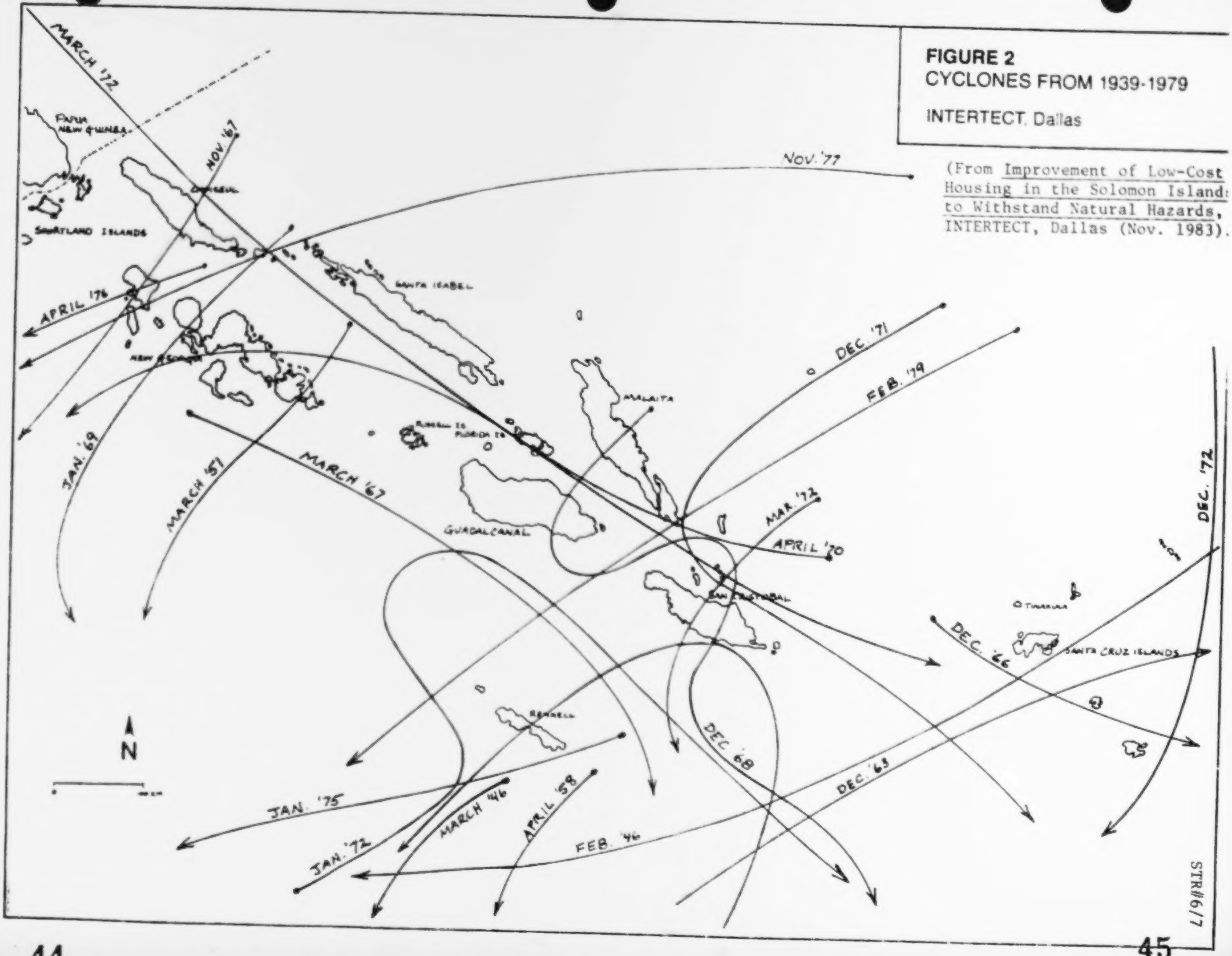
There is no consideration of natural disasters in the Solomon Islands National Development Plan 1975-1979 or the Programme of Action 1981-84. The latter contemplates the upgrading of the meteorological division of the Ministry of Transport, Communications, and Government Utilities; establishment of regional broadcasting stations; and upgrading of the internal telecommunications system (p. 6) - all of which are very important for disaster preparedness. However, the only mention of natural disasters and emergencies is in Appendix C (p. 25) under Home Affairs and National Development, as being their responsibility.

Excerpt from Disaster Preparedness and Disaster Experience in the South Pacific, Pacific Islands Development Program, East-West Center, Honolulu, Hawaii (August 1982).

FIGURE 2
CYCLONES FROM 1939-1979

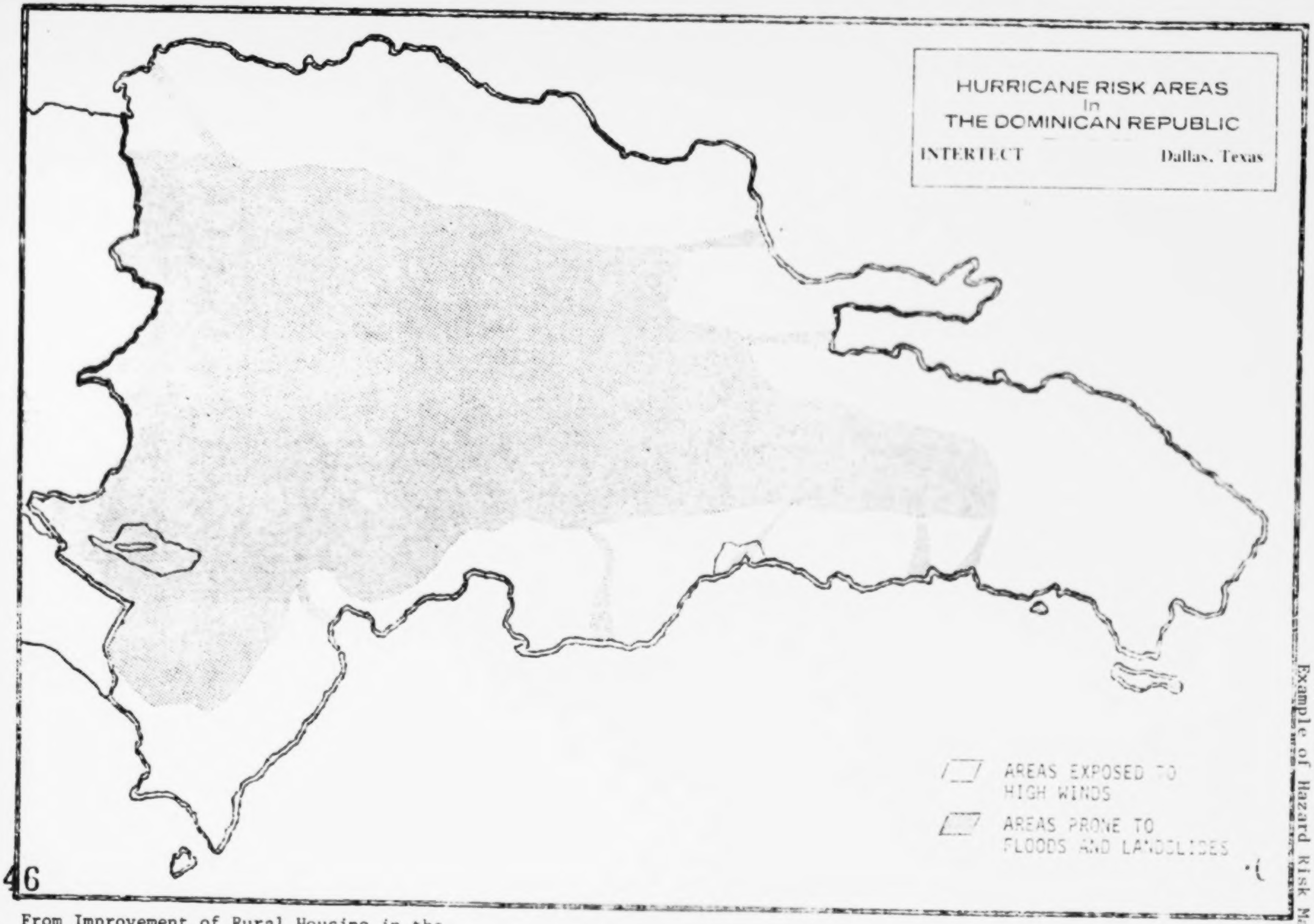
INTERTECT, Dallas

(From Improvement of Low-Cost Housing in the Solomon Islands to Withstand Natural Hazards, INTERTECT, Dallas (Nov. 1983).


MARCH '72
NOV. '67
PAPUA NEW GUINEA
CHOISEUL
SHORTLAND ISLANDS
APRIL '76
NEW GEORGIA
SANTA ISABEL
NOV. '77
DEC. '71
FEB. '79
MALAITA
RUSSELL IS.
FLORIDA IS.
JAN. '69
MARCH '51
MARCH '67
GUADALCANAL
MAR. '72
APRIL '70
SAN CRISTOBAL
DEC. '72
DEC. '66
SANTA CRUZ ISLANDS
RENNELL
N
DEC '68
DEC. '63
JAN. '75
JAN. '72
MARCH '46
APRIL '58
FEB. '46

STR#6/7

Supplemental Trainer Ref. #7
Example of Hazard Risk Map


HURRICANE RISK AREAS
In
THE DOMINICAN REPUBLIC
INTERTECT
Dallas, Texas
AREAS EXPOSED TO HIGH WINDS
AREAS PRONE TO FLOODS AND LANDSLIDES

From Improvement of Rural Housing in the Dominican Republic to Withstand Hurricanes and Earthquakes, INTERTECT, Dallas (April 1981).

Figure 2

Supplemental Trainer Ref. #8
Answers to TRUE/FALSE Quiz

Pre-Training Questionnaire

		TRUE/FALSE
1.	Cholera is a major public health threat after most hurricane disasters.	False
2.	Churches and schools make good hurricane shelters.	False
3.	Corpses found in earthquake rubble do not pose a serious epidemic threat.	True
4.	Disasters do not discriminate between developed and developing countries or between rich and poor people within a country.	False
5.	After a disaster, the victims are often in shock and unable to help themselves.	False
6.	After a disaster, the primary needs are food, blankets and medicines.	False
7.	Tents are the most efficient form of emergency shelter.	False
8.	The speed at which a community recovers from a disaster is largely linked to the speed with which emergency and reconstruction assistance is provided.	False
9.	International aid after an emergency is largely based on the needs of the donor rather than the needs of the victim.	True
10.	Concrete block houses are more earthquake resistant than adobe houses.	False
11.	There is a possibility that my site may experience a disaster during my two years of service.	True

TRAINING MODULE

Part II

SUMMARY OF MODULE

DISASTERS AND DEVELOPMENT

(Total Time: Minimum 3 hours)

SESSION #1: Introduction to Natural Disasters
[1 hour and 45 minutes]

Participants first take a short TRUE/FALSE quiz that addresses some of the key issues that are commonly subject to responses based on widely held misconceptions regarding disasters. The trainer then gives a lecturette covering a brief history of the natural disasters that have struck the host country and the short- and long-term impacts of the most recent disasters.

Act I of a case study/play, covering the pre-disaster, disaster event and immediate emergency relief phases, is read aloud, followed by a group discussion.

Act II of the disaster play, covering the transitional recovery phase, is then also read aloud, followed by group discussion. In this session, the relationship between disasters, disaster relief and development is established, laying the foundation for the following session.

SESSION #2: The Role of Peace Corps Volunteers in Disaster Mitigation and Preparedness
[1 hour and 20 minutes]

The final act of the disaster play, covering the mitigation and preparedness phases, is read. Key issues relating to these activities are then discussed.

The class next divides into groups (by technical sector) to identify specific actions that they can take during their time in-country that relate to the different disaster phases discussed.

The groups then come together again as a class to share and discuss their ideas.

SESSION #1

INTRODUCTION TO NATURAL DISASTERS

Notes/Summary

RATIONALE FOR THE TRAINING SESSION:

Many of the countries where Peace Corps Volunteers serve are at risk from natural hazards such as hurricanes, earthquakes, droughts or floods. Historically, PCVs have been called upon to play active roles during the emergency and reconstruction phases. But many Volunteers have felt frustrated that they "couldn't do more" in these times of great need or, in retrospect, that what actions they did take may not have been the most beneficial in the long run. Furthermore, PCVs have often found that much of the progress they had been making in their development projects was severely set back or even wiped out by a disaster. Much of the negative impact of a disaster is due to mishandling of response activities, which is due in turn to a lack of information and broad misconceptions about disaster events.

Thus, while Peace Corps is not a disaster relief agency per se, it is important that Peace Corps Volunteers be aware of the disaster threat(s) to which their country and specific site may be exposed, and of the true nature of disasters and their relationship to development.

This session will begin to lay a foundation of knowledge by first making the trainees aware of the many myths commonly held regarding natural disasters, and then by providing some basic information that will allow them to more fully learn from and evaluate a fictional case study/play.

[Total time: Approximately 1 hour and 45 min.]

GOALS

1. To identify lessons learned from past disasters and common myths about traditional relief activities.

2. To identify and explain the causes and effects of natural disasters affecting participants' country of service.
3. To identify short-term effects of disasters on the development of people and national economies.
4. To highlight the need for preparedness activities.

TRAINER PREPARATION FOR SESSION

1. The material in this training module is by necessity very general in that it covers many types of natural hazards. In order to make this relevant to your trainees, it is very important that you first do some research on the specific natural hazard(s) to which the trainees' country of service is at risk. For example, you should find out whether your country is in an earthquake-prone region or lies in a hurricane belt. It will be even more useful if you can identify which regions of the country are at greatest risk. For example, you may find that only a particular coastal zone is exposed to hurricanes or that a certain region is particularly susceptible to flooding. In order to obtain this information, contact one of the following:

--- The Mission Disaster Relief Officer (MDRO) of the USAID Mission.

--- Your country's Office of Emergency Response & Preparedness Planning, if one exists (note: this office may have many different names but you should be able to track it down through the AID MDRO).

--- The National Red Cross or Red Crescent Society in your country.

--- The Civil Defense Agency.

2. Ideally, you should also be able to get a "Disaster History" listing from one of the above that will give you an historical perspective of actual disasters that have

struck your country and their damage (see Supplemental Trainer Reference #6 for an example of a disaster history of the Solomon Islands). In addition, the Office of U.S. Foreign Disaster Assistance (OFDA) of AID maintains "profiles" of many countries in the region that can provide useful basic information for pre-disaster planning.

3. It would also be very useful if you could prepare a handout with the names of the organizations and/or key people who are currently involved in disaster-related work in your specific country (see Supplemental Trainer Reference #3 for a general discussion of actors and roles).

4. If possible, acquire the disaster plans of (a) the national government; (b) Peace Corps; (c) the USAID Mission; (d) a private voluntary organization (PVO) such as CARE or Save the Children. An awareness and understanding of these plans will be useful to you and to the trainees, especially if any of these plans include the involvement of Peace Corps Volunteers during a disaster. If no disaster plans exist, or if you are not able to obtain copies, then that is very relevant information in itself.

5. Depending on what you find in your research in steps 1-4, thoroughly read the handouts which relate to the specific disaster threat(s) to your country (i.e. cyclonic storms, earthquakes, floods, droughts, etc.). While you are not expected to become an expert geologist or meteorologist, you should try to become very familiar with the terms and information provided in these handouts.

6. Study the statements and answers in the TRUE/FALSE quiz that you will be giving to the trainees at the beginning of the session (Supplemental Trainer Ref. #8).

7. If you have experienced a disaster (perhaps as a Peace Corps Volunteer), you should spend some time thinking about that experience and how it affected you, your

Notes/Summary

community, your development project and the country as a whole. If you have not experienced a disaster yourself, you may want to interview someone who has (e.g., a fellow trainer or in-country resource person).

8. You may also want to talk to some people and prepare your thoughts on trends in your country which are making it more vulnerable to disasters (e.g., urban migration leading to overcrowded slums on steep hillsides or lowlying flood-prone river beds, or firewood shortages that increase deforestation which may lead to rapid rain runoff, flooding and landslides). (See Supplemental Trainer Reference #1, "Disasters and Development".)

9. Recruit "reader-actors" for the case study/play before the sessions begin. [Trainees may be acceptable as reader/actors so long as they are given the opportunity to read through the entire play before the session. However, it is preferable to use non-trainees so that all trainees can concentrate on the entire case study.]

   Plan the details of the sessions beforehand (participant seating arrangements, whether trainer(s) will sit/stand, etc.) and go over them with the trainers/actors. Go over the roles and sequence of monologues to ensure a smooth presentation before the entire class.

10. Prepare necessary newsprint/blackboard and handouts.

Materials Needed

--- newsprint
--- markers
--- pencils and paper

Prepared Newsprint/Blackboard

--- session goals
--- country map indicating hazard risk areas (see Supplemental Trainer Ref. #7)
--- issues to discuss

Handouts

--- Pre-session TRUE/FALSE quiz
--- Glossary of terms and concepts
--- Case study/play (for trainer/actors)
--- Disaster history of host country (if available)

PROCEDURES

Opening Statement [5 min.]

1. Begin the session by telling the participants:

   "While you are here as development workers, not as relief workers, sometime during your two-year service (name of country) may experience a natural disaster which may profoundly affect the country, the development projects you will be working on, and you directly. Although the possibility of a disaster is not an unforeseen event, many PCVs have found themselves and the community they live in unprepared to effectively respond to an emergency or long-term reconstruction. Many PCVs, while well-meaning, have often provided emergency assistance that, in retrospect, resulted in more harm than good. Often the disasters (or inappropriate disaster response) have wiped out or greatly set back any progress the PCVs may have made in development projects."

2. Tell them that: "the next two sessions will focus on:

   --- providing basic information on the causes and effects of disasters affecting your country;

   --- creating an awareness of the relationship between disasters and development;

   --- identifying some of the common problems (and related myths) of traditional relief activities and lessons learned from past disasters;

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--- identifying what PCVs can do as part of your normal development work to help mitigate and prepare for future disasters."

Then read the Session 1 goals from the prepared flipchart/blackboard.

Hand out the pre-session TRUE/FALSE Quiz on disaster myths (HO #1). [10 min.]

1. Instruct them not to spend a lot of time thinking about these questions, as they will be spending the next three hours doing just that. Ask them to just quickly answer the questions based on the reservoir of knowledge that they have built up over the years from newspaper accounts or movies/books about disasters.

2. Once they have completed the pre-test, explain that:

   "Research on past disasters and disaster responses has shown a consistent pattern of inappropriate action based on commonly held misconceptions about what happens or should happen during a disaster. The purpose of this test is to make you aware of some misconceptions that you may hold as well."

   Then give them the answers and ask them to keep these statements at the back of their minds as they listen to the following disaster case study/play. Note that the correct answers to these questions are not as important to the goals of this class as is the basic awareness that many responses to disasters are based on widely-held misconceptions.

Pass out "Concepts and Terms" (HO #2). [5 min.]

Ask the participants to spend a few minutes reading the handout so that they will have a common terminology. You may wish to go over the list with the participants to ensure that the definitions are clear.

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Give a brief disaster history. [5 min.]

1. Tell the participants that the first step in effective disaster preparedness is knowing that you live in an area which is at risk from natural phenomena such as hurricanes, earthquakes, floods, etc.

2. Give a lecturette on what specific natural hazards threaten the country you are in and what the recent disaster history has been, for example:

"Honduras is threatened by hurricanes, floods and earthquakes. In the past 100 years, the country has been struck by many hurricanes including major ones in 1954, 1969 and, most recently, Hurricane Fifi in 1974. Hurricane Fifi battered Honduras with winds of 110 mph and rainfall of up to 16 inches in 24 hours. The storm left nearly one-third of the country flooded and razed the productive north coast. Damages included:

--- At least 8,000 people died and a total of 600,000 were seriously affected.

--- 90-95% of the banana crop (the most important export article) was destroyed.

--- 60% of roads, bridges, railways, harbors and airports were destroyed.

--- The national cattle herd was reduced by over 6%.

--- The dollar damage was valued at $540 million (in a country with an annual GNP in 1973 of $850 million).

--- The national deficit went from $15.6 million in 1973 to $56.8 million in 1975."

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[Trainer Note: In your research you may come across a ready-made case history of recent disasters or a list of disasters and the damage and losses incurred which you may want to copy and hand out at this time.]

3. You should also identify the times of year when disasters are likely to occur (for example, the hurricane season).

4. Finally, you should identify the key organizations and people in your country who are involved in disaster-related activities.

Introduce the disaster case study/play. [25 min.]

1. Tell the participants:

"In order to see how each part of the disaster relief system works, we have constructed a fictitious disaster and described events as they often occur. All the events and actions of the agencies are based on actual occurrences.

"A hurricane has been chosen as the scenario for this exercise because it enables us to look not only at post-disaster actions, but also at activities that occur prior to a disaster when there is a warning period. While each type of disaster is unique, the events in the case study/play are representative of all sudden-onset natural disasters.

"This play has three acts which roughly coincide with the phases of a disaster. Act I discusses the pre-disaster setting, the disaster and emergency phase. Act II discusses the transitional recovery phase. Act III dicusses the long-term mitigation and preparedness phase.

"After each act we will jointly discuss the relevant issues. Many of the issues will relate to the myths we first looked at in the pre-session TRUE/FALSE quiz.

"After you have all 'lived through' a disaster cycle, you can begin to develop some specific ideas and plans relevant to your work assignments."

2. Read Act I. (The readers should be at the front of the class.)

   [Trainer Note: Please note that this disaster case study/play is a form of guided role-playing, so it is important to have readers who can perform their roles effectively.]

3. After the play is read, put up the following prepared newsprint:

Issues to Discuss

1. Priorities during the emergency.
2. Rumors.
3. Uses of churches and schools as shelter.
4. Complacency of the population and its leaders.
5. Lack of preparedness.
6. Coordination among agencies.
7. Overconfidence of relief/development agencies.
8. Disaster assessment - what, when, and how.
9. Foreign aid during an emergency -- effective or counterproductive?
10. Resourcefulness of victims.

4. Lead a discussion of the above issues. [20 min.]

   It is important to remind the trainees that there are no easy/simple answers, and that actions taken during any disaster must be based on the specific circumstances of that disaster. However, these general issues arise in almost every natural disaster and general approaches to these issues should be kept in mind when PCVs are called upon to respond to a disaster event.

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Guide the discussion of these issues in such a way that the participants begin to identify the interrelationships at work in the case study/play. Some sample questions that might be used to stimulate and guide the group are as follows:

Issue #1: What were the priorities held by each person during the emergency? Were they the appropriate priorities? Were some of the priorities counterproductive?

Issue #2: What was the impact of rumors during the emergency period? Do rumors make people take inappropriate actions?

Issue #3: Are churches and schools logical emergency shelters? Why or why not? Is there any reason to know that churches and schools are, in fact, structurally safe?

Issue #4: Did you think that the population and its leaders were complacent? Was it justified? Is it realistic to expect that they would have been less complacent?

Issue #5: How prepared were the various characters? Was the Red Cross really ready? Who seemed to be the most prepared? Why? Whose lack of preparedness seems the most irresponsible?

Issue #6: How would you characterize the coordination among the agencies? Why would coordination of each agency's efforts be important?

Issue #7: What was the basis of the confidence the relief agencies had in themselves? What are the dangers of relief agencies working in emergencies in countries where they have no prior experience?

Issue #8: What is the importance of a post-disaster damage and/or needs assessment? How can it be conducted in order to get the right information at the right time? Is it important to centralize information collection and data processing?

Issue #9: Was some of the foreign aid counter-productive? What should be done to minimize the disruptiveness of foreign aid? Which forms of foreign aid were most effective?

Issue #10: In what ways are disaster victims better qualified to help themselves than are service providers? How did these victims exhibit their resourcefulness?

5. Read Act II. [15 min.]

6. Put up the following prepared newsprint:

Issues to Discuss

1. Economic aid.
2. Reconstruction materials -- should they be sold?
3. Housing approaches -- provide technical assistance or build houses?
4. Tents, clothes, medicines, etc. -- effective or timely?
5. Food aid - what, how much, should it be sold?
6. Relief aid -- does it delay reconstruction?
7. Interaction between government and voluntary agencies.
8. Donor constraints -- what needs are being met?
9. Role of outside volunteers (not PCVs).
10. Waste caused by haste.

7. Lead a discussion of the above issues. [20 min.]

Again, these are general issues which arise in most natural disasters. Some sample questions that you might use to guide the discussion are as follows:

Issue #1: What forms did the economic aid take? What aid programs seemed most productive?

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Issue #2: Is it legitimate post-disaster aid to sell reconstruction materials when the economic condition of the disaster victim couldn't be worse? Are all low-income disaster victims who lose their homes in dire economic straits? What happens when aid is given away to (a) the individual recipient; (b) his future expectations; (c) the status of development programs in process when the disaster occurred? What, in principle, is a fair price for materials that are sold?

Issue #3: What are the relative advantages of a post-disaster aid program that builds houses for disaster victims? What are the disadvantages? What are the relative advantages of a post-disaster aid program that provides technical assistance to disaster victims to rebuild their homes?

Issue #4: Was the provision of tents, clothes and medicines an effective form of disaster relief? What do you think it would cost to bring 10 planeloads of goods of this sort from the U.S. and Europe here? If a half or less of that aid was used, was this money well spent? How is it possible for donors in the U.S. and Europe to know what would be an appropriate supply of clothes or medicines or tents that would serve in the victims' climate and culture?

Issue #5: Was there really a shortage of food? Where? Who did it affect? For those people who were cut off from their food supply, what are alternative methods of getting food to them? What if they were cut off from their food supply because they lost their crops and stores in the disaster? What if it was because they lost their jobs and could not afford to buy food? What if it was because their usual means of transport was cut off?

Issue #6: Is speed of reconstruction an important objective to pursue? Should speed of reconstruction be a guiding policy for relief agencies? Is it possible for a relief agency that is new to a disaster-stricken country or one with a very small permanent staff to implement a reconstruction program in a timely and appropriate fashion? In what ways might relief aid delay reconstruction?

Issue #7: In what ways are government and voluntary agencies interdependent during post-disaster reconstruction? Are voluntary agencies doing what the government really should be doing? What is an appropriate level of government control over voluntary agency activities? How can voluntary agencies support government programs?

Issue #8: Is it legitimate for donors to put constraints of time and type of program on the operational staff of an agency? What are the donor's needs in the relief process? If the donor's needs are in conflict with the victim's needs, what should be done to resolve the problem?

Issue #9: Can volunteers from outside the disaster area really be effective? Who? How? What are appropriate roles for them? What are inappropriate roles?

Issue #10: In a relief program administered in a crisis, is it possible to avoid waste? Is haste really one of the highest priorities? What forms of waste in the play were avoidable and counterproductive?

8. At the end of the discussion, tell the participants: "We have now examined some of the issues that confront development and relief personnel during and after a natural disaster. During the next session we will explore the relationship between disasters and development and begin the process of defining ways to incorporate mitigation and preparedness activities into our projects as Peace Corps Volunteers".

If you will continue the training immediately, take a brief break at this point. If you will continue at a later period on the same day or on the next day, announce the time to trainees before adjourning.

[Minimum 15-minute break]

CASE STUDY/PLAY

"HURRICANE UFFDA"

HURRICANE UFFDA

Cast of Characters:

Narrator, the reader who introduces the characters and settings

Col. Frank Top, Director, National Emergency & Reconstruction Committee

Clark Kent, Peace Corps Country Director

John Goodspeed, Peace Corps Volunteer

Don Farmer, host country farmer (rural peasant)

Flo Morningbreeze, host country nurse

Mary Steward, host country shop keeper, volunteer with the Red Cross

ACT I

Narrator: The country where this play takes place could be right here. We regard it as an important Third World country, but there is generally little known about it in the United States. There have been several natural disasters in the country's history; however, there has been no major disaster within the last 20 years. Most of our country's citizens live in an overcrowded capital, and most of them lead marginal lives and live on marginal land. Much of that land is the cheapest in the city, like river banks and hillsides. As our play is about a hurricane, this means our country needs a coastline exposed to these tropical storms and several communities located near the coast in very low-lying areas. That same area is an important sugar-cane-producing region in the valley, with subsistance farming providing marginal existence to many communities on the hillsides.

One thing about a major disaster -- it happens to everybody. They all have that much in common. But each person has a different experience, a different perspective, different needs, priorities and concerns, both during an emergency and afterwards. The characters that you are about to meet represent some of the important roles that you might encounter should something like this play happen here.

Col. Top: My name is Col. Frank Top. I am assigned to the Ministry of Defense where my primary responsibility is in equipment procurement. The Prime Minister has also asked me to be the Director of the National Emergency & Reconstruction Committee, which we call NERC around here. But, since we haven't had a disaster here for longer than I can remember, that part of my job hasn't been very important.

Kent: Good morning [afternoon]. My name is Clark Kent and I am the Peace Corps Country Director. I've been in country for about four months, so I am just now getting used to the way things are done around here. I am excited, though, about what Peace Corps can contribute to some of the development projects that are going on.

Goodspeed: Hi, I'm John Goodspeed, a Peace Corps Volunteer. I've been here in the country now for nearly a year. I am working with a farmers' co-op where my job is to try to develop better marketing procedures. So far it has been pretty frustrating work. I'm only now beginning to get some of my ideas across; but then again, I'm just now starting to understand these people in my town. It's called Bani and is located about 3 km from the coast. It's near a picturesque harbor with a small fishing village.

Farmer: My name is Don Farmer. People joke about my name because that is what I do ... farm. I like farming but it's darn hard to make a living at it. It's the only thing I know how to to do, though. My wife and I and three kids live on about 4 acres, 10 km north of Bani up in the hills. Only about half of the farm is good for growing crops and the land is owned by a man in the capital. We finished picking the corn about a month ago, but we have some vegetables in the garden most of the year. In a few weeks I'll be going down to the coast to cut sugar cane for the Company. I have to do that every year to make a little cash so that we can buy shoes for the kids and things like that. Maybe things will get a little better if what that Goodspeed is talking about really works. We'll see.

Morningbreeze: My name is Flo Morningbreeze. I grew up in Bani and lived there until I went away to nursing school in the capital. I would have liked to go back to Bani but there was no place for me to work, so I got a job in the hospital in Kasten. Kasten is the regional capital about 30 km from Bani. The hospital is small and understaffed. We have 40 beds, three doctors, and five nurses on each shift. My days get to be real long and I sometimes wonder what we would do if we ever had a real emergency, like an airplane crash or something.

Steward: I'm getting the impression that my fellow countrymen are a lot of chronic complainers. Well, I like it here in this country and I'm doing OK. My name is Mary Steward and I run a general merchandise shop in the capital. We don't sell anything fancy, but the good stuff is almost all imported. Lately, I've had a real tough time getting things in, and when I do the prices are getting too high for my customers. The international market really has my business all messed up. Sometimes I can get away from the problems at the store and do some community work. So I volunteer with the local Red Cross. We have monthly meetings and do some projects in the community like first aid training.

Narrator: Now that we have introduced all our cast, let's get on with the story. We've been in the hurricane season now for several weeks, but the weather has continued to be normal. Up until today, that is; this is August 1. Let's look in on the Colonel.

Col. Top: The corporal just handed me a memo. Let's see, it says here, "To: Director, National Emergency & Reconstruction Committee; From: Director, National Weather Service.... The International Hurricane Tracking Network has identified the formation of a tropical depression approximately 1000 km off our southeast coast. It is a large storm system and will require monitoring". .... So what does he mean by that? I'll have to give him a call.... Hello, Weather Service? Look, I got this memo about a "tropical depression". Is this going to be a hurricane and is it going to hit us or what?.... What do you mean, wind storms are too difficult to predict; that's your job, isn't it?.... Alright, so tell me again, what are a hurricane watch and a hurricane warning?.... A hurricane watch is the first-stage alert coming 48 hours before a hurricane might strike.... and a hurricane warning is posted when the hurricane is only 24 hours away.... Alright, thanks, goodbye.... Well, it sure doesn't sound serious. Corporal, file this memo.

Narrator: That memo may not have seemed important yesterday, but today is August 2 and there have been new developments.

Col. Top: What's this, corporal, another memo from the Weather Service? It says that they have been notified by the International Hurricane Tracking Network that the storm has intensified beyond 74 miles an hour and that it is now a full-fledged hurricane. The network has alerted the World Meteorological Organization, the United

Nations Disaster Relief Office (UNDRO), and various international disaster assistance agencies.

Corporal, get that list of members of the National Emergency & Reconstruction Committee and ask them to come here to a meeting at 4:00 this afternoon.

Morningbreeze: I heard on the radio this morning that there is a big storm coming this way, but my landlady told me not to worry. She said that a hurricane has never hit Kasten.

Kent: News about the hurricane doesn't sound good. On the one hand, I should tell Col. Top that the Peace Corps stands ready to help if the hurricane strikes. On the other hand, I had better order the PCVs to get on the first bus going to the capital and take cover.

Col. Top: We had this meeting of NERC but only seven of the twelve members showed up. After getting more double-talk from the weatherman, I called the International Hurricane Tracking Network myself. The guy there said that the direction of the hurricane is still too erratic to predict a projected hurricane track. But he also said that, in his opinion, it probably won't hit us. Everybody else at the meeting did not want to issue any statement that would alarm the public. However, proper procedures require that I put the government and the armed forces on standby alert.

Steward: We had our monthly meeting of the Red Cross this evening. The main agenda was a discussion on the standardization of bandage sizes. Somebody raised the question of the hurricane. The chairman got out the guides issued by the League of Red Cross Societies on what to do in case of emergencies. It looked like most of the recommendations were for things that should have been done long ago. But we all agreed that we really know what to do and, for the most part, the Red Cross is ready.

Narrator: During the night the hurricane intensifies and begins to move in a westward direction. It is given the name "Uffda" and hourly reports on its position are broadcast on the radio. The reports note that the change in direction now means that it is poised directly at the eastern coast of the country. It is now August 3.

Morningbreeze: My supervisor at the hospital must be worried about the hurricane. This morning she asked me to take an inventory of all the drugs on hand that she thought would be needed to treat diseases following a hurricane. It doesn't look good. We are either low on the drugs or all out.

Col. Top: Corporal, I've got this long list of drugs from the hospital administrator at Kasten. She tells me that they are out of them but they will be needed in case of emergency. Send a telex to the International Emergency Assistance Agency and ask them to send these medicines immediately. Also call another meeting of the NERC for 10:00 this morning.

Kent: The Mission Disaster Relief Officer over at AID gave me a call first thing this morning. He's never been through a disaster before either. His main concern is that Peace Corps tell its Volunteers to get to shelter. But it's probably too late to get any messages to them. I just hope they have enough sense to get to a church or school for safe shelter.

Col. Top: Thank you all for coming to this hastily called meeting. A quick situation report is that the Weather Service says they will issue a Hurricane Watch this afternoon unless the storm changes direction. Our agenda right now is to draw up a plan of operation and to look for a strong building with good radio communications and telephone links to the entire country. It would be used as an emergency operations center. I also want each of you to contact your respective government ministries or agencies. Make sure the protection of all equipment critical to the operation of each ministry or agency is given a high priority. I want building materials and sandbags from the Public Works Department sent to the low-lying and exposed areas to protect installations there. Focus your attention on the coastal areas.

Goodspeed: Everybody out here in Bani is glued to their radios. This morning they said there was a Hurricane Watch on, and then an hour later they said that it was a false alarm. The people don't seem to know what to do. Some folks are boarding up their windows and picking food from their gardens. My counterpart, who works in the farmers' co-op, invited me over to his house to have a hurricane party with his family. But I think I will make a run to the market for some food and try to figure out what I can use to close up my windows. Other than that, I have a strong house that should be able to take a hard blow.

Narrator: News of the hurricane has reached our former colonial ruler where many of our folks have immigrated. The news media senses a growing interest in the story and teams of reporters are being dispatched to our country to provide a minute-by-minute account if the hurricanes strikes. None of the correspondents have ever experienced a hurricane before.

The time is now 1:00 a.m. on August 4. The storm further intensifies and moves rapidly toward the coast.

Col. Top: Look, I realize it's late but our NERC committee here has got to develop an evacuation plan for the people living in the low-lying areas. I'll ask the chairman of the Red Cross to update this list of hurricane shelters that was prepared a few years ago. When it's ready, I'll have the corporal get it to the news media.

Morningbreeze: When I got up this morning at 6:00, I heard the radio announce a Hurricane Warning. I still find it hard to believe that a hurricane could actually hit us within a day. Then the newscaster read a list of shelters. But that wasn't too useful because it included the old elementary school building. When I asked my landlady where it was, she said that it was torn down two years ago!

Goodspeed: My neighbor came over this morning to say that he heard the NERC was considering recommending that people along the coast in Bani evacuate to high ground. But they didn't say exactly where to go. My neighbor said, "You're from the States; what are we supposed to do?". I've got less of an idea than they do, but I had better find out.

At noon I went down to the store and all I could tell about a storm coming was that the tides were high. There is no wind but there have been some rain showers.

Steward: I've had an incredible rush in my shop today on things people think they will need in an emergency. Candles, nails, wire, batteries, kerosene and stuff like that are almost all gone. Some of the shops up the street are taking advantage of the situation and really raising their prices.

Col. Top: Our office has taken nearly a dozen phone calls in the last hour from people complaining about price gouging. We notified the Prime Minister who said he would declare profiteering illegal.

Goodspeed: About 4:30 this afternoon a team from EuroVision News showed up in Bani. They immediately picked up on stories of profiteering and telecast some well-armed store owners who look like they are defending themselves against potential looters. My neighbor seems to be insulted by both the store owners and the television crew.

Col. Top: At 5:00 p.m. the Weather Service announced that the hurricane has begun to move again. Its course puts it on a track which will bring it directly into contact with the central and southern portions of the country. The hurricane is predicted to strike early tomorrow morning. Winds on the coast are now gusting up to 50 miles an hour. I will now issue the order for residents to evacuate the area around Bani as quickly as possible and seek shelter in the churches and schools in communities on higher ground.

Kent: Late this afternoon we received a telex at the Peace Corps office from the International Emergency Assistance Agency. They said they couldn't get through to NERC and asked us to pass on the message that it is impossible to deliver the requested medical supplies due to the proximity of the storm.

Farmer: At 10:30 this evening my brother, his wife and two kids showed up at our house. He's a fisherman who lives near the harbor in Bani. He was really scared and said that they got a ride out of the area on the back of a friend's pickup. When they left, nearly an hour ago, the water was coming across the only road that separates his village from the sea. Big breakers were eroding the roadbed, and many of the cars and trucks trying to leave were stalled on the road. They were one of the last families out before the road went under water, leaving most of the people stranded.

Col. Top: Corporal, get me in touch with the Army engineering battalion and ask them to evacuate the village at the Bani harbor.

Goodspeed: Things are really getting hairy! Just before midnight, I heard that the army trying to evacuate the harbor had to give up. They put in some small boats to try a rescue by water but it was too rough. Somebody said they thought there were still about 2,000 people stuck over there with no place to go except their rooftops.

Narrator: Just after midnight on August 5, communication from the capital to outlying areas is lost. At 2:00 a.m. the eye of the hurricane passes about midway between the capital and Bani. Winds reach a peak of 125 miles per hour.

Goodspeed: What a night! The noise was incredible. Things were flying all over and I never knew if I should be opening up windows on one side of the house and closing them on the other side or what. I crept outside this morning about 7:00 to see what had happened. Winds were still about 60 miles an hour. What a mess! Uprooted trees, roofing sheets, boards everywhere. Every house in my neighborhood looks damaged and at least half are probably beyond repair. Most of my roof is off; the wood frame walls are all racked out of shape and partly pushed off the foundation. And my house was better than most in this neighborhood.

Kent: That was the most terrifying night of my life. I kept waiting for something to go. Our family lucked out, though; the biggest damage was a tree that blew over and landed within 5 feet of the house. Now I've got to figure out how to get in touch with the Volunteers. All telephone lines are down and roads are closed. I'll ask the AID Mission if they can get a helicopter for me to get out to the sites and check on them.

Morningbreeze: By the time I got to the hospital this morning at 8:00, the place was overrun with people. Mainly severe cuts and broken bones, a few concussions. By noon we had about 150 people who needed beds. We only have 40. Some people were saying that something awful had happened at the Bani harbor. But nobody seems to know what has happened in the rural areas beyond Bani.

Col. Top: At 1:00 this afternoon I was ordered by the Prime Minister to join him, the Red Cross director, and some cabinet ministers on a helicopter tour of the affected area. The Prime Minister was shocked by the extent of the damage and we were all appalled by the conditions at the Bani harbor. It looked completely devastated. The few survivors there looked desperate for help. When we got back we were informed that a tidal surge swept inland nearly 20 miles in the delta region. The sugar cane is ruined and whole villages are wiped out.

Steward: The Red Cross volunteers were asked by NERC to collect information on the extent of damage and injuries in our own neighborhoods. When I was out canvassing the area I saw others from the university also taking surveys. One was doing a health survey; another was doing a house damage survey. We all seem to be using different survey questionnaires and looking at different things. There obviously hasn't been any effective coordination on this damage and needs assessment. Everything I have heard, though, indicates that the death toll and damage are high.

Col. Top: This disaster is made worse by all kinds of reporters hounding me for information and asking what the government is going to do. Corporal, tell those reporters to hold off until our information is ready. I agree with our NERC committee that the first thing we need to do is conduct a thorough survey of the damage and centralize the data collection in this office. I also want the Red Cross to coordinate all disaster relief activities during the emergency.

Kent: The AID Mission Disaster Relief Officer was injured last night by some broken glass, so he asked me to attend the special meeting of NERC. It was called for representatives of voluntary agencies and foreign embassies and was held at 8:00 this evening. We received a situation report and the Foreign Minister read a list of pledges of aid and assistance that have been received from other governments. We asked NERC for instructions, but apparently no plans or activities have been considered. It looks to me like a real problem of indecision and lack of leadership.

From what I hear, the international press is here in force and is making this the number one news story around the world.

Morningbreeze: This is getting terrible! It's late at night and injured people are still coming in. I was told to get set up for a massive vaccination program against epidemics, but we don't have either the time or the supplies. I'm not even sure what we will vaccinate for.

Narrator: So ends the first day of the disaster. Overseas, spontaneous donations of relief goods begin to arrive at voluntary agency offices, churches and our consulates. The donations are especialy heavy in communities with large numbers of people who have immigrated from our country.

At UNDRO headquarters in Geneva, a donor list is established to record all major donations. An announcement of its availability is sent to a long list of voluntary agencies and foreign ministries.

The time is now 7:30 a.m. on August 6.

Col. Top: I am really drained. I only got one hour of sleep last night and this morning the Prime Minister went on national radio at 7:00 to announce that he has taken personal command of emergency operations and reconstruction. He then appointed a new coordinating committee to take over from NERC. It will be directed by General Crum, head of Civil Defense. I will be the liaison from NERC and will be in charge of public relations. My first job is to draft a plea to the international community for massive assistance. The second is to get a message to the people to take precautions in their personal hygiene and to be especially careful to boil all drinking water.

Steward: I've been at the Red Cross office all night. At 8:00 a.m. we sent a telex to the League of Red Cross Societies and asked for international assistance. We specifically requested tents, clothing, medicines and food.

Kent: I've asked my assistant director to get in touch with all Volunteers in the disaster area and find out how they are. One Volunteer here in the capital survived just fine and this morning went out to the airport to help with the incoming relief materials. Already, planeloads of tents, medicines, blankets and canned food are coming in.

Morningbreeze: At 10:00 a.m. a doctor here in our hospital reported a possible case of typhus. Within an hour the Prime Minister ordered mass innoculation of all residents in the disaster area. But we have run out of almost all medical supplies.

Col. Top: What a mess! I got a request from the hospital administrator at Kasten asking for more medical supplies. So I have to pass that request on to the governments that have offered disaster assistance. But at the same time medical supplies are pouring in at the airport and I have no idea what kind they are. The corporal tells me that some of the medicines coming in are expired and useless.

We are starting to get what look like accurate casualty reports from outside the capital area. It's devastating. There has been heavy loss of life in the delta region, with the largest number of casualties reported in the collapse of churches and schools used as shelters. In one church alone, 400 people are reported dead. The roofs were blown off most of the schools, including several that were used as shelters. The worst is at the Bani harbor. Nearly 2000 people were lost, mainly drowned in the storm surge.

Steward: At noon we had a meeting with the local voluntary agencies and church groups at our Red Cross headquarters to decide what to do. After three hours it became obvious that it will take a long time to sort out who is going to be responsible for each facet of relief.

Farmer: I can't believe this is all happening. Our whole family spent the day just cleaning up the debris around the farm. The roof was blown off. The shed for the animals is totally gone and only one goat survived. Our vegetables are ruined but the corn in the bin is OK. It looks like I've lost part of my farm; one field was wiped out in a landslide. The first thing I will have to do is get some sort of temporary roof on the house to at least keep the rain out.

Kent: I was able to get a line to call Washington this afternoon to give a situation report. I was told that televised news reports of the disaster have already begun to arrive there. The reporting focused on the tragedy of the Bani harbor. Reports are also depicting the government as inept and they are saying that, unless massive international assistance is received, survivors will starve to death.

Col. Top: I've gotten telexes from several international voluntary agencies who are sending their personnel to the area. They are coming to assess the needs and to coordinate their relief efforts. UNDRO is also sending a person.

Narrator: The airlift of aid continues through the night and into the next day, August 7, the second day after the disaster.

Col. Top: Stuff is piling up at the airport at a rate beyond belief, at least beyond our experience. My corporal has come back in from the airport and reports that most aid materials are coming from foreign governments. Apparently they are coming from stockpiles of certain relief items, basically bulk food like rice, flour, cooking oil and salt, as well as medicines and tents. Shipments from voluntary agencies are a real mixed bag of goods and include various kitchen utensils, tools, flashlights, medicines, a wide assortment of food, hurricane lamps, clothing, blankets, an odd assortment of camping supplies and water purification tablets. It seems that the materials are packed according to size and each bundle contains a hodge-podge of different things. Most people at the airport are spending all their time just sorting out all the stuff.

Goodspeed: At this point I am a little numb. I spent all of today helping the rescue team at the harbor, pulling out bodies and distributing food to the survivors. One of the members of my farmers' co-op and his family are staying in my house. They lost everything. Most people are living in makeshift shelters of salvaged materials that they pulled out of the wreckage of their houses.

Narrator: It's been three days since the hurricane began its assault on our formerly peaceful country. There are no natural laws that say when the emergency period is over but convention has it that, after between 48 and 72 hours, most life-endangering conditions are under control. So we'll use this as a good time to bring Act I to a close.

ACT II

Narrator: As I said awhile ago, the state of emergency is relative. We may not have any more of our countrymen in danger of being killed or dying of exposure, but there are many other sorts of personal emergencies. Convention has it, though, that this is the beginning of the rehabilitation phase. People are trying to re-establish a semblance of normalcy. The dead are buried; the personal grieving is masked by intense activity. Businesses are reopening, farmers are clearing up the mess, and the government is trying to get everything back in at least minimal running order. Let's see how Mary Steward is doing with her business. Today is August 8.

Steward: Getting the business back in operation has not been easy. Most of our main stocks are out. I can't get a telephone call through to my suppliers, but I doubt that they would have supplies anyway. It almost doesn't matter because I don't know what my customers are going to want to buy. All of this relief stuff is being dumped on the market and given away. Who is going to buy it from me if they can get it free? I don't know, maybe I don't have it so bad. Rumors are that a lot of stores were looted and wiped out.

Col. Top: I've heard the rumors too from the corporal. There are reports about looting in the news but nobody has given me any specific information. We will start a sun-down to sun-up curfew in the disaster area until further notice.

The road crews have finally been able to partially re-open most of the major roads that were closed by landslides and washouts. We'll be able to start truck convoys of relief goods to areas outside the capital.

Kent: After receiving a request from the Emergency Committee, Peace Corps sent three more Volunteers out to the airport. Some PCVs from the north, where the hurricane didn't hit, have come in to the capital. They will help out at some of the private voluntary agencies that are gearing up for an influx of relief supplies. The Volunteers around the Bani area are all too busy helping at the relief distribution centers to even call in to our office.

Goodspeed: I have barely slept in three days. I'm temporarily out of a job. I mean, what can I do to develop better marketing practices for farm products when there's no market, right? So I've been helping people dig stuff out of the wrecks of their houses. There weren't many valuables, but we pulled out whatever furniture that wasn't ruined and all of the wood and roofing that could be salvaged. We really had to scramble to get some kind of temporary shelters set up. By today everybody pretty much has things under cover and protected. And, wouldn't you know it, just as we finished an army truck pulled up with a load of tents; they set them up in the park and then drove off. I don't know who is going to use them, except for the kids who are playing hide-and-seek around them.

Morningbreeze: After working nearly non-stop for three days, we were finally able to take a break. Two Peace Corps nurses who had been up north came in to help us. But it is taking much of my time just showing them our procedures.

Kent: Word has it from the States that the voluntary agencies who have been raising money are being asked by the press what their plans are for relief and reconstruction. No doubt the public relations folks are assuring them that planning is going ahead full-steam; but when I contact their field staff here to see about placing Volunteers with them, I find that they haven't even come up with a plan. It sounds like more staff will be brought in to speed things up.

Narrator: Coming to terms with what to do and how to do it is obviously hard for everyone. Maybe it will be easier by today, August 9.

Col. Top: General Crum has asked me to call this meeting of the Emergency Relief Committee here this morning. I had hoped that representatives of all the relief agencies would be here, but a few key ones are missing. What we are going to do, in order to reduce duplication of effort, is ask that each agency take on responsibility for relief and reconstruction in a particular sector or town. I have a list of the communities here on the chalkboard and each agency will pick one or two to assist. The left-over communities will be divided among the agencies that aren't here today.

Kent: That meeting this morning was not much more than a lottery. At least we have some direction. But I'm worried about some of these agencies being able to pull it off. Some of them strike me as amateurs who are here more on a lark than anything else.

Goodspeed: Some of my neighbors are coming to me every day and asking for me to arrange for a free house or a job for them. They don't seem to understand that I have no control over things like that. Even if I did, where would I begin?

Narrator: Some people are starting to call this the disaster after the disaster. There are news stories of corruption and favoritism in the distribution of relief supplies. It is now August 10, five days after the disaster.

Steward: For the first few days I was busy full-time working with the Red Cross. Now the Prime Minister has asked the churches to form committees to oversee the distribution of relief goods in each community. For me that is a relief; I need to spend more time at the shop.

Kent: All right, who's on first?! I got three phone calls this morning asking Peace Corps to attend three different coordination meetings convened by three different agencies. Who is coordinating the coordinators?

Farmer: The Prime Minister came to Bani today. They broadcast his speech on national radio. He says we will rebuild everything, bigger and better. But he says that will mean that we will have to work together, that all political parties will have to cooperate. Then two hours later I hear on the radio that the opposition leader is saying there is "massive corruption" in the relief programs and he says he will make equality of aid an issue in the next election. I know darn well I want my share. The townspeople in Bani are getting nice new houses and all they have offered me is 10 roofing sheets at half-price. I still don't know how I'll be able to afford flour and other food from the market, and my kids are kept out of school as long as the school is being used as a shelter.

Narrator: Today is August 11.

Col. Top: Corporal, draft a memo to the Prime Minister that at 10:00 a.m. the Emergency Relief Committee held a coordination meeting between the government and voluntary agencies to discuss various topics. Housing reconstruction was identified as the top priority. At 12:30 the field representative for UNDRO arrived. He offered to coordinate foreign assistance. I agreed to his proprosal and have called a coordination meeting for tomorrow.

Farmer: On the radio this evening, there was a program by some evangelical missionaries. They are calling for a national day of prayer. They also say that it was our sins that brought on this disaster. Maybe they are right.

Narrator: The frenzy of day-to-day activity has slowed down by now. We just got through the first week since the disaster. We'll look at the next week's activities together, August 11 - 17.

Kent: I'm spending all of my time going to meetings, some at the government, others called by the voluntary agencies. I didn't even get to the UNDRO meeting.

I've finally gotten a census on all the PCVs in the disaster area and they are all safe. It is becoming apparent that most of their programs will have to be redesigned.

Steward: The Red Cross is receiving huge amounts of money from overseas. The donors are requiring that the money get to the victims as quickly as possible and that we have only 30 to 90 days to spend it all.

Morningbreeze: I know what he means, "disaster after the disaster". We finally were able to deal with the patient needs at the hospital; in fact, we had some empty beds. And then a whole bunch of foreign doctors arrived. They have literally been pestering us, asking for assignments and vehicles. Some of our doctors are spending more time with the foreign doctors than with the patients.

Goodspeed: Now we are seeing a new class of stuff coming into the country: prefab houses. In fact, some of them aren't even houses but are garden-variety tool sheds. The salespeople are claiming to have the "ultimate solution" for low-cost housing. Some claim their house is temporary and others say theirs is a permanent housing solution.

Col. Top: All these houses. Who knows which ones to build or which ones the government should support? General Crum decided to have a housing fair where all the manufacturers can set up their units and show them to the public. Let the market decide.

Farmer: My wife went down to Bani today to get some of the relief food. The lines were real long and she had to wait a long time. But that's the price you have to pay for free food. I haven't sold my corn yet and the price for it has gone to pot. I'll be even worse off than I am now if I can't sell it soon.

Col. Top: The main purpose of this meeting of the Emergency Relief Committee is to clear the air on the distribution of food aid. A lot of you people from the voluntary agencies are claiming that free food distribution will be counterproductive. The government strongly disagrees. There are hungry people out there who need our help. To ask victims to pay for food or other aid would be against the humanitarian principles of disaster relief. All aid will be given free to the victims. We do not agree with you that this will create dependencies.

Furthermore, I want to make clear our government's policy on housing. We have to move rapidly as the rainy season is only five months off. However, we must build housing of permanent materials that will be hurricane-proof. I know that some of you think this will cost more and will limit the number of housing units that you can build, but this will be our policy.

Narrator: During the third week, August 18-24, emphasis begins to shift away from emergency relief activities to concern about interim recovery and longer-term reconstruction needs. The Prime Minister is saying that there is a change in the post-disaster realities and that he will appoint a National Reconstruction Committee. The Emergency Relief Committee will remain active until all relief needs have been met. Col. Top will be the liaison between the two committees.

Col. Top: I am beginning to think the chief responsibility of this office is to act as an airport limousine service. I have a group of international bankers coming in today for talks on financial loans to the government. The Prime Minister has ordered the Finance Ministry to give top priority to refinancing some of the national debt.

Now the foreign military has arrived. At least I know how to deal with them. They are starting to repair roads and bridges and they have the heavy equipment to do it. First priority is to open up all the roads in the mountains that were closed by landslides.

Steward: Fortunately, I had my business insured. The adjusters have already completed their report and, on the whole, I didn't do too badly. Now my problem is to find a qualified carpenter to repair the store. It seems like everybody and his brother are claiming they are builders, and they are charging three times the rate they charged before the hurricane. Even at that, they are all busy.

Farmer: I am really getting mad. An unbelievable amount of free food is being dumped in the whole disaster area and the price of corn is at an all-time low. I've got to rebuild my house and barn, but the price of tools and building materials is going out of sight. My brother got a temporary job driving a truck for a relief agency.

Col. Top: We have a big agenda for today's meeting of the National Reconstruction Committee. First, I want to inform you that the government will not support a program of price controls. We feel that it would create a black market that would only make matters worse. Second, we have received many requests from voluntary agencies asking for technical literature on reconstruction of housing. Some have also asked for technical data about agricultural recovery in the areas flooded by salt water from the storm surge. The corporal here will try to locate this information as soon as possible. Third, I want to announce that the National Housing Bank has a new program of low-interest loans for housing repair and replacement. There will be special criteria to help the poor to apply for these loans.

Goodspeed: I recently got assigned to a voluntary agency named Beta Aid that is working in Bani. We are in the middle of a housing construction program, but it is not without its problems. Beta Aid was required by their headquarters to spend all of their donated money within 90 days of the hurricane. But there was no way we could use the house design that we wanted and get all the houses built in that time. The field director asked for a time extension from headquarters but it was denied. So we had to pull out all the stops, hire laborers from outside the disaster area, pick a real simple house design and mass-produce it.

Col. Top: I must say, the National Reconstruction Committee and the voluntary agencies are very impressed with that Beta Aid program. They really are getting those houses up fast.

Farmer: My cousin and his family were given one of those Beta Aid houses. Boy, are they awful! It's too little even for their small family; they put the door on the wrong side; the tin roof is so low that it is like an oven in there during the day. And besides that, they are poorly-built and ugly. The only good thing about it that I can see is that they can take the house apart and re-use some of the materials when they build a permanent house.

Narrator: The coordination meetings are now poorly attended and, in the future, will be held only once every two weeks. The UNDRO rep submits his final report and leaves. The Prime Minister lifts the curfew and declares that the emergency is over. And so is Act II.

ACT III

Narrator: At the beginning of Act III, we start the fourth week after the disaster, August 25-31.

Col. Top: Corporal, draft a press release and make sure all voluntary agencies receive a copy. Announce that we have modified our policy on the distribution of relief goods to allow sales of certain items. Each agency can determine their own procedures and criteria. Acknowledge that we have received complaints from the countryside that there are considerable differences in quality and amount of aid given among the agencies. However, we still do not feel it is advisable to establish uniform reconstruction policies. Between you and me, if we did set standards, it would just create even more resentment and rivalry between the agencies.

Goodspeed: I finally took a day off and went over to visit a fellow PCV working in a town between here and Kasten. Things have pretty much come to a stop there. He was working with a co-op that was putting together a housing program. Then, just this week, an agency came in that had only arrived in country the day before. They called a town meeting and told the people that they should stop rebuilding. The agency said that they will rebuild a model community and that materials and expertise will be arriving in several weeks. My friend was coaxed into being the interpreter. Now he feels that the community identifies him with the project even though he thinks it is a bad idea. In any case, now nobody is doing anything.

Kent: I've been working with the Peace Corps program officer trying to develop the new programs. It is our intent to be responsive to the government's stated priority on housing, but we can't figure out where to best put our apples. On the one hand I see editorials in the newspapers that call for the government to take measures that will keep a disaster like this from happening again, things like implementing building and zoning codes. Nearly every day there are articles on how to build hurricane-resistant housing, but these are ideas based on technology coming out of Europe and the States. They don't look to me like they apply here very well. On the other hand, I'm not seeing any information on how to improve the traditional low-cost housing. AID tells me that over 80% of the country consists of traditional housing. But these editorials are saying that traditional house types should be banned altogether because they are inherently unsafe. Then the one agency that is rebuilding traditional types of housing has been criticized for rebuilding and institutionalizing slums. Where do we go from here?

Narrator: The rate of work towards recovery continues at an intense pace, but the significant events become less frequent. The first month since the disaster is behind us and we'll now look at the next six months together.

Col. Top: We are still getting a lot of aid pouring into the country, but at least it is manageable now. Most of it is construction materials, particularly roofing sheets and lumber. The majority of it is coming from governments, although some of the agencies involved in housing are shipping in some of their own materials too.

Farmer: I've gotten together with the other members of our co-op and we have sent a message to the Ministry of Agriculture. We told them that we are not going to replant our fields because people are hoarding all that free food and they will not be buying our food at next harvest time. First I lose my barn, half my house, my goats, half a field slid away in the landslide, the sugar cane was wiped out so I can't make any cash; and now I'm not even going to have my farm income next year either.

Goodspeed: I think everybody is teed-off over the unfair way the distribution of reconstruction materials is going. All the pressure coming in from the agencies finally got the government to develop a model approach for reconstruction and relief aid. But as far as I can see, it was too little too late. Everybody is ignoring their model. The more I look at the houses we built with Beta Aid, the more I worry about them. I doubt if they would take a strong wind.

Steward: My husband's family has owned a large farm for generations, located on the edge of the capital city. Yesterday, a big group of tenant farmers, led by some radical community organizers, squatted on the farm. They say that they lost their homes in the disaster, but that doesn't give them the right to take over our land. We called the police and demanded that the people be kicked off, but the government is too afraid of the political consequences. A compromise we could live with would be for the government to buy the land from us.

Col. Top: We will not tolerate that kind of land seizure that took place out at Steward's farm. I will announce that those squatters will each receive a parcel of land but absolutely no aid in the form of construction materials or urbanization. That had better put a stop to any future squatting.

Goodspeed: One of the European church groups has defied the government and supplied truckloads of building materials to the people at Steward's farm. Now there are these land invasions happening all over the disaster area. My Volunteer friend over by Kasten told me that many families he was working with are organizing a land invasion there too.

Kent: In talking with the Minister of Housing today, I learned they realize that the Ministry's policy on permanent housing is unrealistic. They will agree to permit reconstruction programs to rebuild traditional housing so long as what gets built is "safe". But from what I know of the National Housing Bank, they will not give loans to people building traditional houses.

Farmer: My brother figured he wasn't ever going to get his regular job back, so he moved to the capital to look for work. So far he hasn't found anything. There are already thousands of people like him also looking for jobs. Out of desperation he joined one of the land invasions. He figured it would be the only way he could get any sort of house for his family.

Col. Top: The Prime Minister asked for a summary report on the housing reconstruction. Of the total 45 non-governmental programs, 29 are located within the capital or its immediate vicinity, 10 are located along the highway between the capital and the delta, and a few are located in the mountains. The corporal seemed a bit sarcastic when he commented that the closer the victims are to the main highway or the capital, the more likely they are to get a housing project.

Kent: We are finally getting some direction from the government on housing programs. After the Reconstruction Committee published their report, the government was pressured into starting a whole series of housing projects for disaster victims. The pilot project will be near the Bani harbor. Now why are they going to rebuild a place that was just proven to be disaster-prone?

Morningbreeze: All the foreign doctors are finally gone. I guess the good side of this disaster is that one government is going to donate a new wing for our hospital; another is going to equip a new operating room and lab. I don't know what it has to do with the hurricane or who is going to staff the additions, though.

Narrator: In Europe and North America, news of the disaster is gone from public consciousness. There is a feeling within the relief and development agencies that a certain kind of normalcy has been achieved.

Col. Top: I've just finished a new report for the Prime Minister on the housing reconstruction projects. Almost all of the foreign agencies have pulled out of the country claiming that they were finished with their programs. However, our National Reconstruction Committee survey shows that 60% of the urban residents and 85% of the people in the rural areas are still without replacement housing.

Farmer: The government was finally able to guarantee minimum prices for corn, so I went ahead and put in half the usual planting. I am just about to harvest the corn and will have some money to start rebuilding my barn and house. But all those agencies that were here helping us folks build houses have now left the country.

Col. Top: The Ministry of Agriculture reported to our office that total food production for next year will be very low. We will have to make food aid agreements with donor agencies for the coming year. Sometimes I wonder when I will ever get back to my job at the Ministry of Defense.

Narrator: It has been three years now since the disaster. Housing construction is continuing, in fact, is at its peak of activity now that the economy has stabilized to some degree. A survey by the National Reconstruction Committee reports that a large percentage of the houses built during earlier reconstruction activities are now vacant. A different survey by U.N. experts reports that the majority of housing designs constructed by the relief agencies are more dangerous to the occupants than those destroyed in the disaster. Many of the houses have been rebuilt on unsafe sites, notably on land which could flood in heavy rains. General Crum, the former head of the National Reconstruction Committee, announced that he will retire from government and go into the housing business.

THE END

Pre-Training Questionnaire

TRUE/FALSE

1. Cholera is a major public health threat after most hurricane disasters.

2. Churches and schools make good hurricane shelters.

3. Corpses found in earthquake rubble do not pose a serious epidemic threat.

4. Disasters do not discriminate between developed and developing countries or between rich and poor people within a country.

5. After a disaster; the victims are often in shock and unable to help themselves.

6. After a disaster the primary needs are food, blankets and medicines.

7. Tents are the most efficient form of emergency shelter.

8. The speed at which a community recovers from a disaster is largely linked to the speed with which emergency and reconstruction assistance is provided.

9. International aid after an emergency is largely based on the needs of the donor rather than the needs of the victim.

10. Concrete block houses are more earthquake resistant than adobe houses.

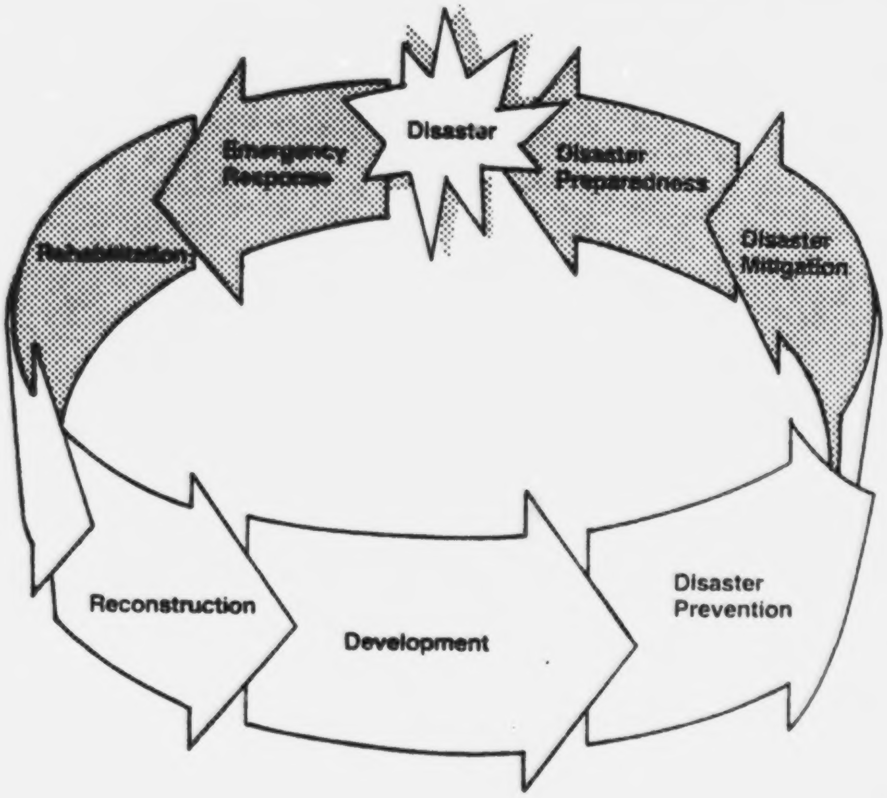
11. There is a possibility that my site may experience a disaster during my two years of service.

CONCEPTS AND TERMS

INTERVENTION:	Action in order to change the course of events. The purpose of disaster intervention is to improve the circumstances of disaster victims. Any disaster response initiated from outside the affected community is a form of intervention.
VICTIM:	A person affected by a disaster. Victims are capable of making intelligent choices and, when special allowances are made so that victims can cope with personal losses, they can participate effectively in all post-disaster activities.
PRE-DISASTER PLANNING:	The process of preparing a set of decisions for action in the future which would create self-sufficiency in dealing with natural phenomena or planning for the effective application of aid. Pre-disaster planning is divided into disaster prevention, mitigation and preparedness.
DISASTER RELIEF:	The reduction of human suffering, the improvement of material well-being, and the restoration of personal security.
DISASTER PREVENTION:	Actions taken to eliminate or avoid harmful natural phenomena and their effects (i.e. cloud seeding to control meteorological patterns; pest control to prevent locust swarms; erection of dams or levees to prevent flooding; etc.).
MITIGATION:	Actions taken to reduce the effects of extreme natural phenomena on both human suffering and property loss. Measures include land use planning, improved disaster resistant building techniques, and better agricultural practices.
PREPAREDNESS:	Actions taken to limit the impact of natural phenomena by structuring response and by effecting a quick and orderly reaction.
RISK:	The relative degree of probability that a hazardous event will occur. An active fault zone, for example, would be an area of high risk.

VULNERABILITY:	A condition wherein human settlements or buildings are exposed to a disaster by virtue of their construction or proximity to hazardous terrain.
RAPID ONSET (CATACLYSMIC) DISASTERS:	Large-scale events causing immediate damage and destruction. Following an event, there may be a tremendous amount of suffering and chaos, but things soon begin to improve. Cataclysmic disasters include earthquakes, volcanic eruptions, cyclonic storms and floods. The damaged area in a cataclysmic disaster is usually relatively small, but loss of life is sudden and therefore dramatic. Cataclysmic disasters can destroy buildings and entire human settlements. In terms of food and food distribution, cataclysmic disasters are normally more disruptive than destructive. They disrupt or damage irrigation, transport and marketing systems and, to a limited extent, they may destroy food supplies. But the extent of destruction depends on the season, location of the disaster, and total area affected.
SLOW ONSET (OR LONG-TERM) AND CONTINUING DISASTERS:	A series of events that gradually culminate in a disaster situation. The situation may remain constant or even deteriorate as time passes. Continuing disasters include droughts, crop failures, and prolonged civil strife. The affected area in a continuing disaster may be extremely large. Continuing disasters disrupt transportation and food distribution networks and can also bring them to a complete halt, perhaps ultimately destroying the system itself.
EMERGENCY PHASE:	The phase of a disaster characterized by actions that are necessary to save lives. They include: search-and-rescue, first aid, emergency medical assistance, restoration of emergency communication and transportation networks and, in some disasters, evacuation from areas still vulnerable to further disaster events. Other actions taken during the emergency phase include initial disaster assessment and emergency repairs to critical facilities.

REHABILITATION (OR TRANSITIONAL) PHASE:	The phase of a disaster which initially includes people's returning to work and the permanent repair of infrastructure, repair of damaged buildings, and other actions necessary to help the community return to normal as quickly as possible. This phase coincides with the period in which emotional recovery normally begins.
RECONSTRUCTION PHASE:	The phase of a disaster which is characterized by the physical reordering of the community and the physical environment. During this period, people reconstruct housing and other buildings and repair roads and other community facilities; and agriculture returns to normal. The actual time span is often very difficult to define. It may start fairly early, even during the recovery period, and may last for many years.


Disaster
Emergency Response
Rehabilitation
Disaster Preparedness
Disaster Mitigation
Reconstruction
Development
Disaster Prevention

DISASTER CONTINUUM

SESSION #2

THE ROLE OF PEACE CORPS VOLUNTEERS IN DISASTER MITIGATION AND PREPAREDNESS

Notes/Summary

RATIONALE FOR THE TRAINING SESSION:

All PCVs have an opportunity to address the root causes of disasters and to help mitigate them. During this session, trainees begin to explore the relationship between their upcoming 2-year development assignment and disaster mitigation and preparedness. This session should stimulate trainees to explore specific mitigation techniques during the remainder of their technical training.

[Total Time: Approximately 1 hour and 20 min.]

GOALS

1. To identify the long-term effects of disasters on development.
2. To show the need for preparedness and mitigation activities.
3. To identify ways in which PCVs can integrate mitigation and preparedness activities with their development projects.

TRAINER PREPARATION FOR SESSION

1. Brief other trainers on their roles in and expected outcomes of the session.
2. Brief technical trainers who may not be involved in this session, but who may be called upon afterwords by participants to discuss specific mitigation techniques.
3. Read Supplemental Trainer Reference #4, "Appropriate Roles for Peace Corps Volunteers in Mitigating, Preparing for and Responding to Disasters". Since you will be leading a group discussion on the

topic, prepare your thoughts on:

- --- how effective mitigation is consistent with the approach and development philosophy of Peace Corps;
- --- the specific sectors in which your trainees will be working (e.g., forestry, health, housing, etc.) and examples of how they can incorporate mitigation into their assignments.

[Trainer Note: Your role as a trainer in this session is not to tell the participants specifically what they can or should be doing in mitigation but to allow them to see the connection between their job assignment and mitigation efforts.]

4. Prepare necessary newsprint/blackboard and handouts.

Materials Needed:

- --- newsprint
- --- markers
- --- pencils and papers

Prepared Newsprint/Blackboard

- --- session goals
- --- an empty matrix of Peace Corps sectors and disaster cycle elements (to be filled in by the trainees)

Handouts

- --- Individual copies of the above matrix
- --- Individual summaries of the specific natural hazards that occur in your host country and their impact
- --- Lists of disaster information resource organizations and periodicals relating to disasters

Notes/Summary

PROCEDURES

Opening Statement [3 min.]

1. Begin the session by restating that their country of assignment is prone to natural disasters and that the trainees should now have a better understanding of important issues that arise during the emergency and reconstruction phases should a disaster strike. Sum up the previous session by telling them that:

   "As Peace Corps Volunteers, you will have a unique role to play because, unlike most others involved in the relief operations, you will have been living and working at the community level, you will know the language and understand the pre-disaster conditions and needs within the affected society. Furthermore, you will be familiar with the important community structures and indigenous coping mechanisms in the society (such as the basic family structure, economic patterns, governmental structure, religious affiliations, customs and practices, and power relationships). In contrast, as we saw in the previous session, few intervenors are familiar with development issues within a community prior to their intervention."

   Tell them that the next session will:

   --- further explore vulnerability to disasters;

   --- bring out the relationship between development work and disaster mitigation and preparation;

   --- begin to design personal strategies for incorporating mitigation and preparedness into their normal, ongoing development assignment.

Read Act III of the case study/play. [10 min.]

Notes/Summary

Discuss key points. [20 min.]

1. When the play is finished, lead a brief discussion. The key points to bring out are:

    --- Disasters are not unforeseen events, and the knowledge and technology now exists that can substantially reduce or mitigate their impact.

    --- The most effective approach to disaster mitigation promotes self-sufficiency through the use of locally-available resources, appropriate technologies, institution building, counterpart training, technology transfer, community organization, etc. Emphasize that this is also the Peace Corps approach to development.

    --- The long-term impact of food aid: The importation of food after a natural disaster is often inappropriate; many disaster events, such as earthquakes, do not destroy the food supply. Imported food aid may have a negative impact on the local economy by destroying the market for farmers as well as wholesalers and retailers.

    --- The combination of material loss following a disaster and the depression of the local economy (lack of jobs, etc.) may result in population shifts from rural to urban areas. Relief and recovery assistance can be planned to support the quick recovery of local markets and to generate jobs.

    --- Land issues are frequently a source of long-term friction following natural disasters. Governments, local agencies and expatriate organizations must find durable solutions for landless victims; otherwise both relief/recovery and normal development programs may be severely undermined.

--- PCVs can promote public awareness of natural hazards and public action to prepare for an impending disaster and, if necessary, to plan for the effective application of aid.

--- PCVs with technical skills (e.g., engineering, architecture, forestry, nutrition, agriculture, etc.) can work with local community groups and leaders on long-term development projects to reduce the physical vulnerability of structures and settlements.

--- PCVs with community organizing skills can work to strengthen the social structure of a community and increase self-sufficiency and reliance on internal resources to improve the ability of local people to cope with disasters.

2. Give specific examples of appropriate roles of PCVs such as: [15 min.]

   - working at the school level to raise public awareness of hazards;
   - initiating housing improvement programs;
   - introducing drought-resistant crops;
   - creating savings-and-loan cooperatives to reduce economic vulnerability;
   - diversifying the agricultural sectors most vulnerable to disasters;
   - helping communities to develop local preparedness plans.

3. Divide the class into small (5-7 people) working groups. It would be preferable to have people with the same technical assignments in the same groups. Put up the matrix (see HO #3 following) and instruct the trainees to come up with specific recommendations of where they can

play a useful role within the disaster cycle (i.e. fill in the boxes) and to identify what more they will have to do and/or learn during their technical training to be able to implement these recommendations. [20 min.]

4. Reconvene and have the group actually fill in the matrix and discuss their conclusions regarding future activities. [10 min.]

Closure [2 min.]

Remind the trainees that they now have a better idea of what can be done to reduce the level of vulnerability of their community but not necessarily how to accomplish it. For example, the trainees should now know that housing improvement programs could effectively reduce the vulnerability of many low-cost and traditional homes, but they probably do not know the appropriate earthquake or hurricane resistant techniques which could be introduced in a community. For that they will need to undertake further research and further training either during the remainder of their in-service training or during a future in-service training session.

In order to assist them with their future research, you should now pass out the remaining applicable reference materials and handouts.

	PEACE CORPS SECTORS				
Disaster cycle elements	Agriculture/ Forestry	Nutrition/ Health	Community Development	Education	Institutional Development
Hazard analysis Geological Meteorological Hydrological Environmental Epidemiological					
Vulnerability analysis Structures and Infrastructure Adjustments Cropping patterns Health conditions					
Preparedness Organization Legislation Planning Education/training					
Mitigation Risk reduction					
Prevention Land use Physical adjustments					
Prediction and warning Technology Interpretation Decision-making Communications Public response					
Relief Mobilization Assessment Coordination					

	Agriculture/ Forestry	Nutrition/ Health	Community Development	Education	Institutional Development
Relief (cont'd.) Resource analysis Procurement Logistics Reporting					
Reconstruction Incentives/ Disincentives Development Strategies					

Source: Frederick Cole, OFDA.

PARTICIPANT REFERENCES

FEATURE (UNDRO News, Nov/Dec 1983) PR#1/1

Disasters: myth and reality

by Prince Sadruddin Aga Khan

The number of disasters is increasing. During the 70s there were more floods, hurricanes, earthquakes, droughts, famines and refugees than in the 1960s. According to meteorologists, weather patterns are changing. The number of deaths caused by disasters was at least four times higher in the 70s than in the 60s.

The need for an appropriate response to these increasing numbers of disasters has become all the more urgent. Unfortunately, the international community's relief aid to disaster victims has not always been appropriate.

Prince Sadruddin Aga Khan, former United Nations High Commissioner for Refugees, draws on his vast personal experience in relief aid to highlight the drawbacks of the current international approach to relief programmes and suggests ways of making the world community's response to disasters more effective.

Au cours des années '70, la terre a connu un nombre croissant de catastrophes. Les perturbations climatiques ont augmenté, nous disent les météorologistes. Les inondations, les ouragans, les tremblements de terre, la sécheresse et la famine ont fait quatre fois plus de morts que pendant les dix années précédentes. Le nombre des réfugiés s'est multiplié.

Mais pour venir en aide aux victimes de ces catastrophes, il ne suffit pas d'augmenter la quantité des secours. Il est essentiel que ces secours soient appropriés aux besoins des victimes.

Tel est le message du Prince Sadruddin Aga Khan, ancient Haut Commissaire des Nations Unies pour les Réfugiés. Dans l'article qui suit, le Prince Sadruddin met en lumière les points faibles de l'assistance apportée par la communauté internationale aux victimes des catastrophes et suggère les moyens de rendre cette aide plus efficace.

The Oxford English Dictionary defines a myth as "a purely fictitious narrative, usually involving supernatural persons and embodying popular ideas on natural phenomena".

Myths are to be found in all societies and at all times in the history of man. They are an essential ingredient in coming to terms with the vicissitudes of life. In many instances they are integral to survival. In parts of Rajasthan in India, the soil is excessively stony and Adivasi tribals fervently believe, as a consequence, that on very dark nights from time immemorial God sends the rain in the form of stones and pebbles — how else can it be explained, when at each ploughing the farmer picks off the stones on the surface of his plot, only to find some months later that new stones appear in abundance? God must have sent them in the dark.

Dangerous taboos

Just south of Mwanza, on the shores of Lake Victoria, a community of people living on a narrow peninsula jutting into the lake, believes that white meat is poisonous. Presumably at some point of time, now long since lost in the mists of history, many people died from eating infected white meat. And so the taboo grew, entrenching itself in the mythology of the tribe. Today, generations later, as periodic bouts of hunger and starvation sweep that community, with all the attendant horrors, misery and human suffering which famine creates, people die within a few feet of a lake brimming over with high-protein fish. "Popular ideas on natural phenomena" ensure that that community is inhibited from maximizing its potential for development, despite the driving force of periodic hunger and malnutrition.

Within certain African tribes, women have an aversion to eating eggs. For some reason not fully understood, the myth has grown that if women eat eggs, they will become barren and remain childless. So, once again, the myth is the means of denying, in this case to women, protein-rich, high-energy food, crucial to human health.

Myths which have grown over generations, perhaps centuries, of human experience, are not easily erased overnight. In some cases, their elimination has brought about havoc and suffering to indigenous peoples. The new myths of western lifestyles are not always happy substitutes.

One does not need to be an expert anthropologist to know that every culture, and every definable sector within a culture, creates and sustains its own myths. This is as true within industrial societies as it is in the Third World. Scientific man is no more free from myths than were his ancient forebears. Modern man and his institutions are subject to myths and taboos every bit as much as man in what we boldly dub the "under-developed" community.

In fact our own particular concern — how to bring relief to fellow human beings caught up in the aftermath of suffering caused by a disaster, be it man made or natural, carries its own dead weight of mythology. One of the most important professional challenges facing the disaster response community is to identify and eliminate that part of its own mythology which is inimical to the best and most effective response it can make to human suffering arising from disaster or emergency situations.

Mythology of disaster response

Take for instance, the natural and very human assumption that if people have been struck by some terrible earthquake or tidal wave and are in dire need, the classic response must be to maximize aid inputs, traditionally food, clothing, blankets and medical supplies to the devastated area. If this response can be moving from the wealthy nations to the poorer devasted areas within hours of the tragedy so much the better, and so, within hours, television, radio and press appeals are made. Governments and relief agencies are lobbied and donors respond generously with airlifts, convoys, even flotillas of ships. Ironically, looking back on some major disasters, it would seem that the speed with which this takes place can only be matched by the speed with which such crises are forgotten. A range of impressive inputs, including skilled experts and the material back-up supplies to keep those experts active for many a

Prince Sadruddin Aga Khan, 50, was for twelve years (1965 77) the UN High Commissioner for Refugees. In July 1983, he founded the *Independent Commission on International Humanitarian Issues,* a body devoted to the study of population movements as a result of natural disasters and political upheavals; shortcomings in international humanitarian law; and the strengthening of international humanitarian institutions in general.

Prince Sadruddin is the son of Sultan Mohammed Shah, Aga Khan III. He was closely associated with UNESCO and is active in the World Wildlife Fund.

Le Prince Sadruddin Aga Khan a été pendant 12 ans (1965 77) Haut Commissaire des Nations Unies pour les réfugiés. En juillet 1983, il a fondé la *Commission indépendante sur les questions humanitaires internationales* qui a pour but d'étudier les mouvements de population engendrés par les catastrophes naturelles et les bouleversements politiques, les insuffisances du droit humanitaire international et le renforcement des institutions humanitaires en général. Le Prince Sadruddin, 50 ans, est le fils du Sultan Mohammed Shah, Aga Khan III et de la Begum, née Andrée Josephine Carron.

long day is set in motion.

Sometimes the reality does demand and justify exactly that kind of response. Often it does not — for the reality may well be that the nation or the community can provide much of that kind of disaster response itself. Outside aid should take a totally different kind of response in that instance. Traditionally the Indian subcontinent is subject to floods, tidal waves and natural disasters of one kind or another. All the countries on that subcontinent have a long and honourable history of producing all the skills and human resources available in the average European or North American community. No agency needs to send doctors, nurses, agriculturalists, hydrologists or sanitation engineers to the sub-continent — they can be recruited locally and put to work from within each of the countries of that region. This was certainly true in 1971 when, as High Commissioner for Refugees, I witnessed the remarkably efficient way in which India rose to the challenge of having to receive millions of refugees from what was then East Pakistan. Indeed, one of the most impressive developments of recent times has been the willingness of young people in the Subcontinent — graduates and skilled tradesmen alike — to volunteer their services in assisting those caught up in some local disaster. It is the logistics of mobilizing these skills which are the challenge. Central and South America can provide the same human and physical resources. Increasingly, the Middle East and certain African countries can offer similar facilities.

Foodstuffs, clothing, blankets and sometimes medical supplies, if not available within the stricken country itself, can usually be purchased in a neighbouring country, with the double effect of reducing the astronomically high cost of transport to the donor and of providing foreign exchange to a developing nation often struggling with a massive balance of payments deficit. Even more worthwhile in the long run is the preservation and enhancement of human dignity which develops and flows from within a community which is self-reliant and which avoids the debilitating experience of being found to be dependent upon others for survival and development.

Well-intentioned but inappropriate

Integral to this point is the appropriateness of aid to a disaster. It is a reality of every disaster and no myth that a great deal of aid is highly inappropriate — indeed at times insensitive and insulting to the beliefs and traditions of the people we are trying to help. European frozen chicken or American corned beef delivered to vegetarian communities in Asia are not welcomed. It may be generally assumed that a hungry person need not have a choice, that what he needs is something, anything, to fill his stomach, but I remember having seen in a major disaster situation, tons of dried fish or French cheese being thrown away because the

UN/Sygma/Lafont

It is a reality of every disaster and no myth that a great deal of aid is highly inappropriate.

victims, however hungry, would not go anywhere near it, not to speak of eating it. Disaster situations may be excellent occasions for dumping surplus food but the donors should not be surprised when the victims or the local authorities do not adequately express their gratitude. Clothing may be vital to survival, but high-heeled shoes or discarded chic fashions are not really appropriate to disaster victims. People living in hot climates, wearing warm winter clothes sent by distant sympathisers as a token of human solidarity, will end up with serious skin problems. This is one area where some NGO's, and occasionally some of our international agency colleagues, still have much to learn.

Shelter is a problem which has received too much attention for me to go into details. One tends to associate disasters with tents during emergencies and corrugated sheets a little later. Would it not be better to use local labour, and particularly the victims themselves, as well as indigenous building material, be it thatch, bamboo or mud, and help the families to be self-sufficient? This approach would not only be cost-effective but also help preserve the environment and the local way of life, and yet these possibilities are rarely explored fully before rushing in tents and eventually alien architecture and foreign materials. UNDRO's 1982 report "Shelter after Disaster — Guidelines for Assistance" represents the most significant contribution to date.

Double-edged weapon

The act of generosity itself can be something of a double-edged weapon. Massive financial inputs, generously donated by the oil-producing community in the mid-70's, proved more devastating than the earth tremor which wrecked and destroyed village homes in a remote mountainous area of Turkey. People there have had to contend with earthquakes for thousands of years and, whilst needing and welcoming help, were quite unable to cope with access to cash inputs beyond their wildest dreams. Corruption set in, family quarrels ensued and social cohesion was threatened. Disaster-prone communities have their own sensitive checks and balances. For these to be disturbed by a disaster is bad enough — for that suffering to be compounded by uncontrolled or insensitive aid is unprofessional and unacceptable.

In the same context, food aid has long since been an issue of some controversy. Food aid, in particular to disaster victims, requires a highly sensitive and delicately balanced response. 10 percent of food aid, which goes immediately and within a tightly controlled limited programme to famine victims, is an essential humanitarian response. For the rest, we must consider very carefully whether there is a mythology of food aid which clouds our judgement. Could the reality be that most food aid is misplaced, unnecessary and counter-productive? This is a difficult and politically charged area of decision-making. All the more reason why we should strive to get the balance right.

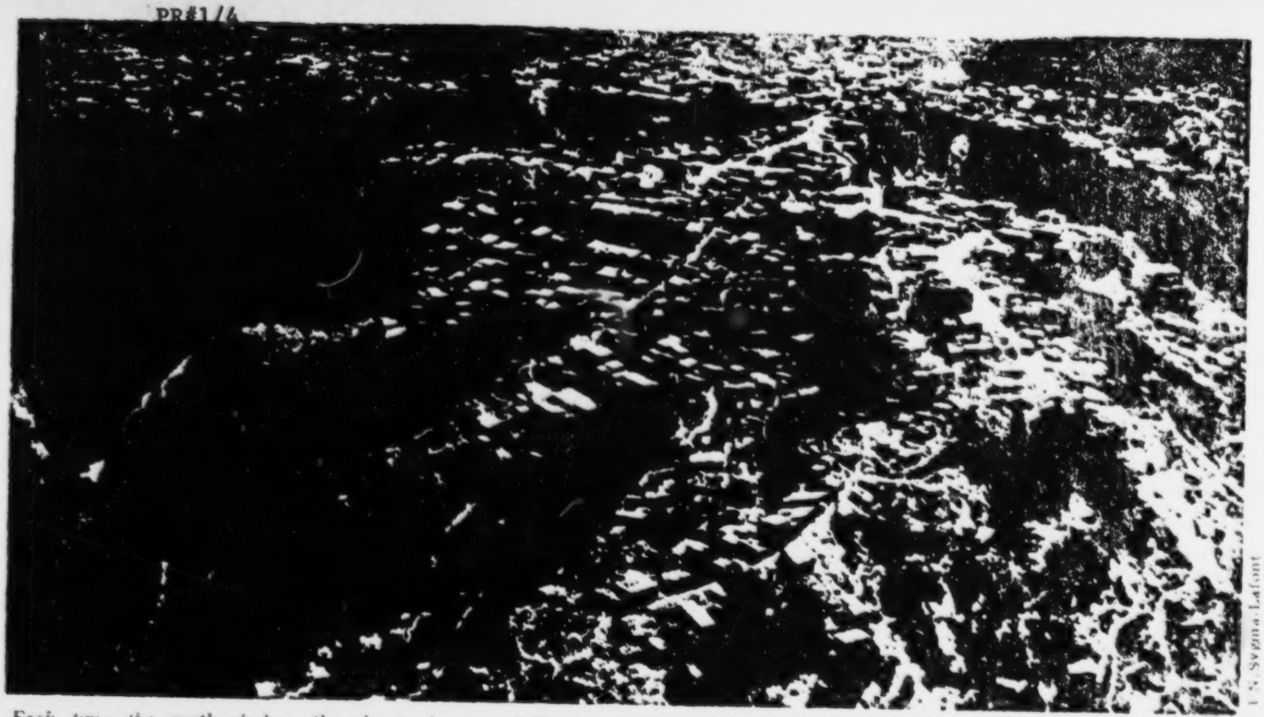
UN/Sygma/Lafont

One tends to associate disasters with tents. "Would it not be better to use local labour, as well as indigenous building material, be it thatch, bamboo or mud?".

Accurate data can improve response

One of the dilemmas the donor agency faces constantly is the quality of intelligence data provided by international agencies like UNDRO and the Red Cross, but particularly by the government of the country in which the disaster occurs if the disaster occurs in a remote or inaccessible part of a country, or has to do with refugees, data is likely to be unreliable and may be totally misleading.

Host countries and countries of origin seldom agree on refugee statistics and differences run into millions, as was the case with India and Pakistan in 1971. The reality is that reliable statistics are by definition very difficult to come by and whilst it would be unreasonable to advocate a policy of "no aid until reliable figures are confirmed", I would urge the international community to strive to improve the reliability of its data and its initial assessment of the reporting from disaster zones. This is something Under-Secretary-General Essaafi of UNDRO is already determined to pursue and the Red Cross is constantly trying to improve its sources of information. Available present-day methods should ensure the accuracy of such data. It should be monitored and released through independent sources whose objectivity could not be



U.N. Sygma-Lafont

Each time the earth shakes, the shanty homes of Guatemala City fall deep into the ravines above which they are built

challenged. This would benefit victims of an emergency and improve the quality of our response. Particularly, is this likely to be true in man made disasters which, by definition, are more politically charged.

Humanitarian challenge of the '80s

The number of disasters is increasing. During the 70's there were more floods, hurricanes, earthquakes, droughts, famines and refugees than in the 1960's. Meteorologists tell us that weather patterns are changing. Statisticians confirm that the number of deaths caused by disasters was at least four times higher in the 70's than in the 60's. Will this trend continue in the 80's?

Surely our common humanity demands the development of more rigorous data assembly and analysis for these growing problems. An agreed approach on their resolution and prevention is essential. Integral to our concern is the increasingly obvious fact that the international community has not evolved a *modus operandi* for dealing effectively with the humanitarian challenge of the 80's.

Many assume that disasters can be divided into two categories, "man made" and "natural". Nothing could be more misleading. The reality is that an increasingly high number of disasters are frequently a consequence of interaction between man and nature, even though they may be precipitated by natural forces. In recent decades man has become the principal causative factor in upsetting the very environmental harmony in which he has a vested interest. We have changed our environment more quickly than we know how to change ourselves.

Most disasters are caused, and certainly compounded, by poverty and the effects of poverty. With four tectonic plates rubbing against each other, earthquakes are going to be a feature of Guatemalan life for years to come. But it is poverty which drives many of the residents of Guatemala City to rebuild their shanty homes on the unstable fingers of sand which radiate from the centre of the capital and which ensure that each time the earth shakes, the houses, with their contents, including so often the families which occupy them, fall deep into the ravines with devastating consequences.

Drought and poverty: almost a nightmare

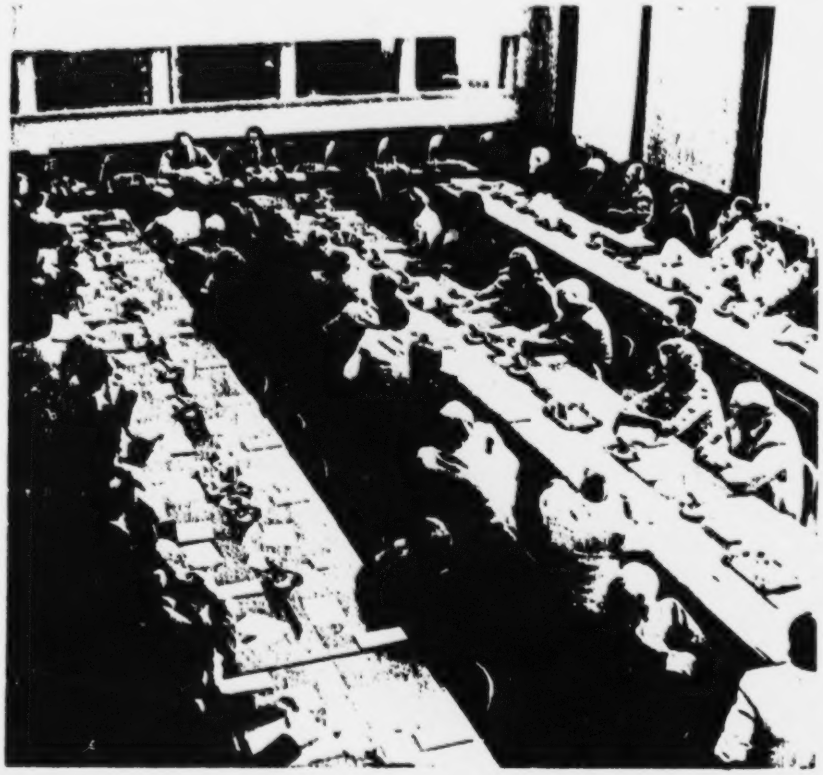
The most recent World Bank Report (26 September 1983), in a confidential memorandum which analyses the poorer countries of sub-Saharan Africa with particular regard to development, concludes that the prospect now facing those countries is "almost a nightmare", nipped as they are between widespread drought and the impossible task of servicing debts and loans.

The situation on the opposite side of the Continent, from Egypt in the North through to Zimbabwe and on to the Republic of South Africa in the South, is that drought and famine are increasingly the order of the day. The same climatic conditions extend eastward to grip the southern half of the Indian sub-continent and stretch even beyond to embrace Indonesia. The combination of poverty and present catastrophic drought is of such magnitude that solutions are difficult to advance with any degree of confidence. Poverty is the fundamental reality now dominating the lives of the majority of the human family.

Rehabilitation and self-reliance

It is essential, therefore, that first phase disaster response should give way, as quickly as possible in any donor's programme to rehabilitation and development. In most disasters this can begin within days of the emergency. The affected community has resources as well as needs. Resources can be put to immediate use.

If properly handled in a calm and planned manner, in the spirit of a bottom-up, self-reliance basis, the chaos and confusion of a disaster can be turned into a unique opportunity for striking a decisive blow against the stark reality of poverty with its attendant trail of human misery and suffering. Why are the governments of most of the disaster-prone countries so indifferent to these realities? The majority have no national disaster plans or concomitant disaster institutions. The myth is that experience is an effective teacher and that countries which regularly have to face natural catastrophes are better prepared to cope with them. The reality is that they have no preparedness. It would seem that their priorities require a thorough re-examination.



Prince Sadruddin Aga Khan gave a lecture on the myths and realities of disaster management at a meeting specially organized by UNDRO in Geneva on 28 September.

On the side of our more proficient agencies, it is clear that structural reforms are equally essential if the reality of poverty is to be challenged.

Land reform is an essential prerequisite to the stability and future prosperity of the troubled regions in the developing world. This will be most difficult to bring about but it is vital to any sustained attack on poverty. If this element, in turn, can be buttressed by general agrarian reform, through which local human resources are mobilized to their optimum advantage, then at long last we can hope to witness that turn in the tide of human affairs for which we all strive.

We often forget that people are poor and hence trapped helplessly in disaster situations because they have no earning capacity and as a consequence no surplus funds at their disposal and no cash with which to overcome the consequences of disaster. Thus, if in the second and third phase response to disasters, we can begin to implement income-generating programmes, we shall then be killing two birds with one stone. Self-reliant, income-generating projects, preferably community based in structure, are almost as vital to progress as land reform. In this context the role of women, the Third World's most under-utilized and badly exploited asset, should and can figure prominently.

Preventive medicine

Health care is fundamental to any effective response to situations of immense and widespread suffering. We have all seen piles of western-brand medicine on airport runways in Third World countries, mountains of pills and drugs labelled in a dozen western languages, none of which are comprehensible to any of the likely recipients. Most are ill adapted to local needs and health requirements. Surely our contribution should be preventative and not only curative medicine. Donor agencies responding to disasters must follow WHO's guidance to concentrate on the essentials: sanitation, disease prevention, oral rehydration, clean water, balanced diets. Locally grown and traditional food should be used instead of expensive imports, produced with additives and chemical fertilizers. Waste disposal in refugee camps might even be transformed into valuable bio-gas. These are relatively simple measures which any experienced disasters officer knows are essential to successfully grappling with large-scale human emergencies.

Disaster relief: almost a fad

One reality which has to be replaced by a new reality concerns the area of inter-agency co-operation. Disaster relief is becoming almost a fad. Projects of voluntary agencies of all kinds are mushrooming, as are scholarly meetings, theories and concepts. Concrete actions and tangible results are, however, lagging far behind.

Close co-operation exists between the League of Red Cross Societies, Oxfam, CRS, the World Council of Churches, the World Lutheran Federation and Caritas. The links between UNDRO, UNHCR, UNICEF and WHO are also better now than they have been perhaps at any time in the past. It remains true, however, that on all these fronts there is ample scope for even better co-operation and liaison. A unified and co-ordinated approach, in a shrinking and inter-dependent world, to the confused and chaotic situation created by catastrophes and disasters still largely eludes us. The United Nations should take the lead.

Thousands of years ago men used to consider natural disasters the results of the anger of gods which they were supposed to accept as punishment for their misdeeds and about which nothing much could be done. One had to simply suffer and try to survive until the next show of anger by the short-tempered gods. This attitude of resignation and fatalism is still prevalent among millions of people, particularly in the developing world and, as gods would have it, disasters occur more frequently in countries which can least afford them. We must come together so as to meet this humanitarian challenge to respond in a way which maximizes our effectiveness.

This is an edited extract of a speech by Prince Sadruddin Aga Khan in the 1983 series of UNDRO Lectures on "Complex Disasters and Emergencies of Exceptional Magnitude".

CYCLONES

DESCRIPTION OF THE THREAT

Cyclones are among the most awesome events that nature can produce and pose a major threat to lives and property in many parts of the world. Every year these sudden, unpredictable, violent storms with winds of over 120 kph bring widespread devastation to coastlines and islands lying in their erratic paths. A windstorm's destructive work is done by the high wind, flood-producing rains and associated storm surges.

A cyclone (also known as a hurricane or typhoon in other parts of the world) is a tropical storm in which the winds reach speeds of over 74 mph (120 kph) and blow in a large spiral around a relatively calm center or eye. Stated simply, cyclones are giant whirlwinds in which the air moves in a large, tightening spiral around a center of extreme low pressure, reaching maximum velocity in a circular band extending outward thirty to fifty kms (20-30 miles) from the edge of the center or eye of the cyclone. Near the center, winds may gust to more than 320 kph (200 mph), and the entire storm dominates the ocean surface and lower atmosphere over tens of thousands of square miles.

In order for a cyclone to form, it must have a warm sea and still air. The warm air rises -- heavy, humid and full of water vapor. Its place is taken by air rushing in from the sides and, because of the earth's rotation, this moving air is given a twist so that the entire system begins to revolve. The warm rising air meets cooler air and releases its water vapor in the form of rain. It takes a lot of energy for the air to lift the water in the first place, and now this energy is released in the form of heat. This increases the rate of ascent of the air, and a continuous cycle begins to develop. More water is released, and thus more heat. The more water and heat released, the faster the cycle goes, and it soon becomes much bigger.

Because the wind system is revolving, centrifugal force tends to throw the air outwards so the pressure in the center becomes very low, thus forming the eye of a cyclone. The pressure on the outside is very high, so the wind moves faster and faster in an attempt to fill that low pressure area. However, the faster it moves, the more the centrifugal force throws it outwards. Soon there are very fast circular winds and, once they reach 120 kph (74 mph), the system becomes a cyclone. Once this process is established, the storm begins to move forward, like a spinning top that moves along the ground. This brings it into contact with more warm sea and air, and the process becomes self-sustaining. Once a cyclone has formed, it will continue to move and expand until either it moves onto the land or runs into an area where the sea is cooler.

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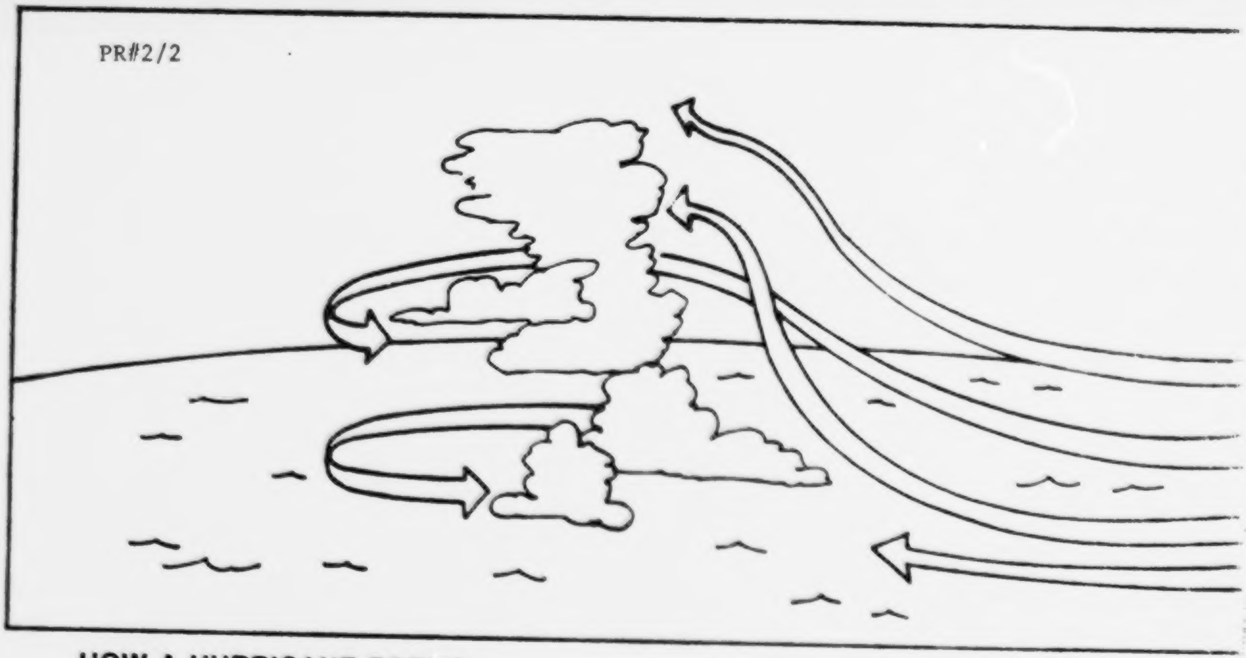
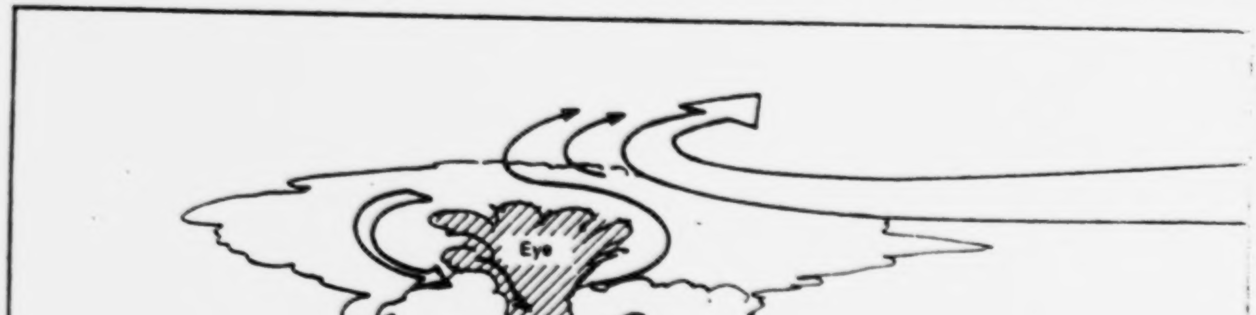


HOW A HURRICANE FORMS

An atmospheric disturbance forces warm moist air of the prevailing Easterlies to rise. As the air cools, water vapor condenses and falls as rain; heat energy is released, and winds intensify.

The storm grows as air spirals inward, rises, and is exhausted from the top by high level winds. Surface air converges at an increasing rate toward the low pressure at the storm center. High winds, heavy rain, and storm surges occur as the storm becomes a mature hurricane



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Cyclones often shift directions and become very erratic. Little is known about what makes cyclones move and change directions, but it is known that they are affected by high altitude winds and the rotation of the earth. At present, scientists do not have the means of predicting exactly where a cyclone will strike land. Therefore, they are always dangerous, as they can change direction without warning.

Devastating floods from extremely heavy rainfall often accompany tropical cyclones. Flash floods of great volume and short duration may result from the cyclone's rain, especially in hilly or mountainous terrain. Runoff from the intense rainfall accumulates quickly in restricted valleys and flows rapidly downstream, often as a large "wave". Flood flows frequently contain large concentrations of sediment and debris.

Storm surges cause the most devastating type of cyclone-related flooding. A storm surge is a rapid rise of the ocean level which takes place as a cyclone approaches. A large mass of water rises above the normal level of the sea and is pushed along by the cyclone system, moving in the same direction as the storm. This movement creates a front or leading edge which may be many kilometers (miles) across and as high as 20 meters (65 ft). The high water behind the leading edge may extend backward for many kilometers. In many instances, the flooding of lowlying coastal lands by storm surges is greatly intensified by coastal topography, the torrential rain, the state of the lunar tide, and the backing up of rivers.

Tidal floods can also be caused by the combination of waves generated by cyclone winds and flood runoff resulting from the heavy rains that accompany cyclones. These floods may extend over large distances along a coastline. Their duration is usually short, being dependent upon the elevation of the tide which rises and falls twice daily.

PRIMARY AND SECONDARY EFFECTS

Cyclones are natural hazards that are not, in and of themselves, disasters. Rather, cyclones are agents or hazards that transform a vulnerable condition into a disaster. The vulnerability of a human settlement is determined by its exposure to the storms, the degree to which the houses and other structures can be damaged, and the likelihood that secondary effects could occur. Urban and rural communities in unprotected, lowlying coastal areas exposed to cyclones, or on river floodplains, are considered vulnerable communities.

The most important determinant of vulnerability is the level of poverty and underdevelopment of a particular group. It is the poor who suffer most in disasters. Poor people generally live in weaker houses which in turn are usually located in the most undesirable and vulnerable areas. Furthermore, dramatic increases in population size, distribution and density increase disaster risk. Urban slums and squatter settlements grow at about twice the average urban rate. Land tenure is also a determinant of vulnerability, especially where there is a scarcity of arable or developed land and poor farmers must engage in agriculture on hazardous floodplains or steep, unstable hillsides that could slip when saturated with rain.

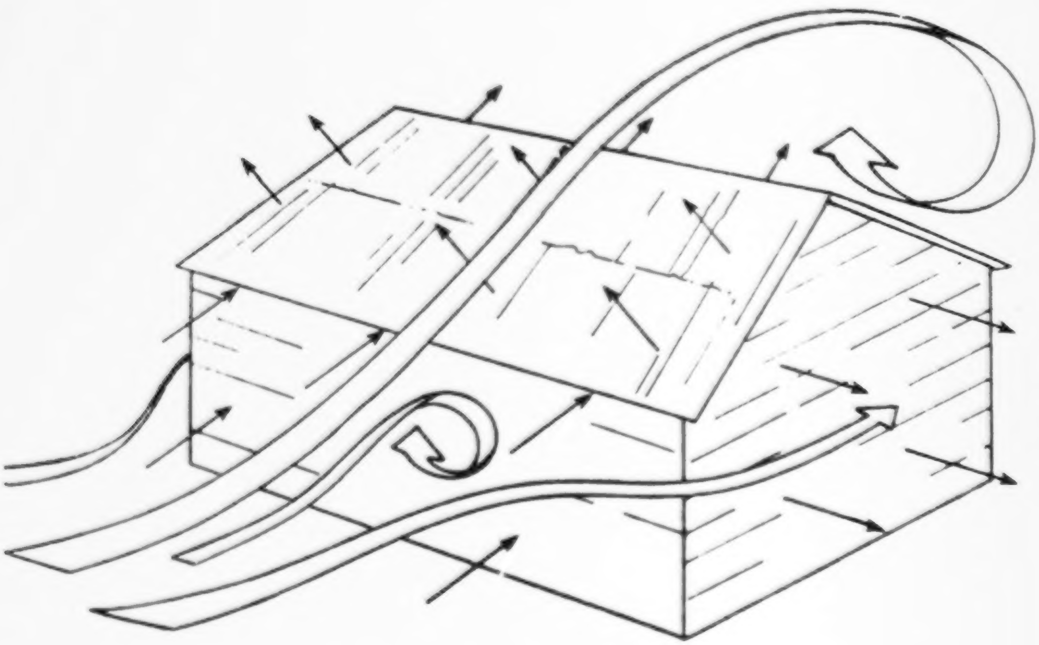
Cyclones kill people. Most loss of life from cyclones is due to drowning, either from the rise in sea water inundating the land or from floods resulting from the excessive rainfall. The number of deaths is significantly higher in developing countries where communications are poor and warning systems and evacuation plans are inadequate. Furthermore, it is expected that the number of deaths will increase as population pressures force people into more vulnerable areas such as lowlying agricultural areas or overcrowded urban slums.

The winds of a cyclone cause deaths and injuries from structural collapse or flying objects, with devastating effects on homes and buildings, agriculture, critical facilities and lifelines. The most dramatic impact of cyclones is the damage they cause to houses. Contrary to popular belief, few houses are blown over; instead they are pulled apart by winds moving swiftly around and over the buildings. This lowers the pressure on the outside and creates suction on the walls and roof.

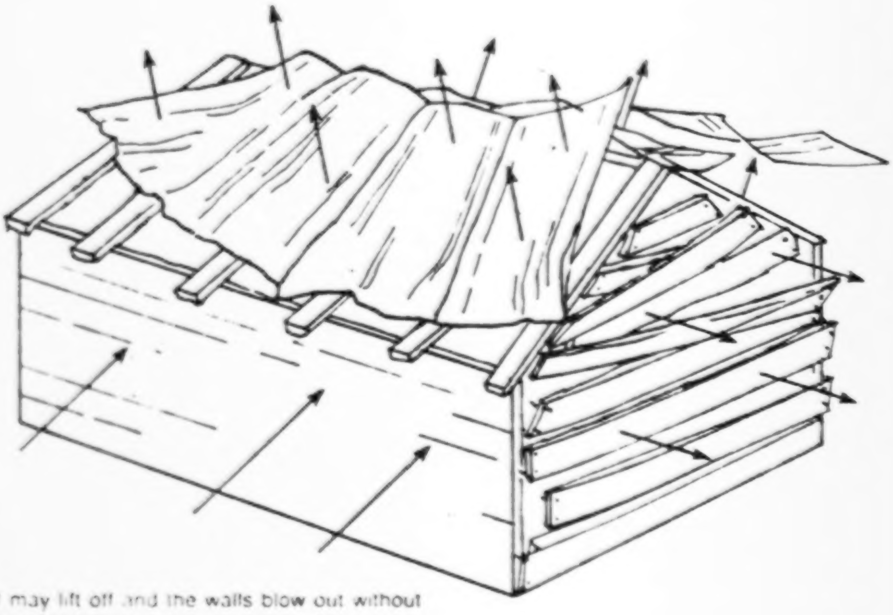
Cyclones can destroy or damage facilities that may be critical not only for responding to the disaster, but also for maintaining a safe environment and public order. Among these are: communications installations; electrical generating and transmission facilities; water storage, purification and pumping facilities; sewage treatment facilities; hospitals; police stations; and various other public and private buildings. The high winds and rains also destroy some crops (especially tubers) and damage orchards and other trees.

Storm surges also damage human settlements and force evacuation, scour and erode topsoils, deposit salts on fields, may increase salinity in the subsurface water table, and destroy most crops. Furthermore, access to markets for buying and selling agricultural produce may be impeded by damage to roads, bridges, railways, etc.

A secondary effect of flooding and cyclones is mudslides. Heavy rains quickly supersaturate hillsides that have been deforested or stripped for farming and can cause immense landslides. Even when little wave or wind damage is recorded, large loss of life may occur in massive mudslides resulting from the torrential rains, especially in squatter settlements located in floodplains.



Wind blowing into a building is slowed at the windward face creating high presure. The air flow separates as it spills around the building, creating low pressure or suction at end walls, roof and leaward walls.



The roof may lift off and the walls blow out without special reinforcement to the structure.

HOW A HURRICANE DAMAGES A BUILDING

LONG-TERM IMPACT ON DEVELOPMENT

Cyclones can significantly retard the long-term economic growth of developing countries. Indirect and secondary effects on the local and national economy of the country may include: reduction in family income; decline in the production of business and industrial enterprises; inflation; increase in income disparities; and decline in national income. In addition, relief and reconstruction efforts often compete with development programs for available funds. In countries where cyclones occur frequently, they can create an enormous financial burden.

The loss of economic opportunity or the need to find alternate sources of income have often forced small farmers to migrate from rural areas to nearby cities. Once established there, few return to rebuild their homes or businesses.

Land issues are of special concern in cyclones because in many cases they have been a major factor in disaster vulnerability. A large percentage of low-income people live in areas that are particularly vulnerable to cyclone and floods such as steep unstable slopes, floodplains, lowlying coastal areas, etc. Following a cyclone, it is usually obvious that those disproportionately affected were living in these vulnerable areas.

Reconstruction programs can also have long-term consequences to a community and its development. One of the primary goals of development efforts is to encourage self-reliance on the part of the people. Yet a massive relief program that does not take development questions into consideration can create disincentives to self-reliance, can establish dependencies on outside leaders, and can foster people's doubts about their ability to control their lives and destinies.

Finally, disasters caused by cyclones often highlight the different social and economic struggles in a society and underscore the inherent inequities within an economic or social system. The cyclone makes it evident that the poor are vulnerable because they are poor, and this can lead to profound political and social change within a society.

IDEAL RESPONSES TO CYCLONE DISASTERS

The following are typical actions that are taken in the various phases in response to cyclone disasters.

A. Mitigation

Reducing the harmful effects of a cyclone requires actions on three fronts: reducing the vulnerability of the physical settlements and structures in which people live; reducing the vulnerability of the economy; and strengthening the social structure of a community so that coping mechanisms can help absorb the impact of the disaster and promote rapid recovery.

The first step in vulnerability reduction for human settlements is to identify the high-risk areas. This is done by relating the effects of the cyclone to the terrain and to the probability that such an event will occur. This activity is known as risk mapping.

The second step in vulnerability reduction is to identify those communities that are particularly susceptible to damage or destruction. This is done by examining the physical structures, especially the housing of the poor.

The third step is to select a vulnerability reduction strategy. Activities may include:

--- Development of extensive public awareness programs to inform the public about the hazards and illustrate what can be done to prevent a disaster;

--- Land-use zoning to control development;

--- Construction of protective works, such as embankments, to protect from flooding;

--- Restrictive development regulations to ensure that any development meets certain standards that take into consideration the threat to the site;

--- Land swaps, which would provide alternatives to development of the site;

--- Imposition of design criteria or building standards to govern construction;

--- Development of construction techniques that are wind resistant;

--- Conducting a program to introduce the improved construction techniques to the building industry and general public;

--- Conducting a program to modify and strengthen existing structures;

--- Development of incentives to remove unsafe buildings and buildings on unsafe sites or, more probable, to upgrade their level of safety;

--- Development of incentives to encourage future development on safer sites and safer methods of construction, such as favorable taxation, loans or subsidies to those qualifying in terms of building methods or sites;

--- Diversification of agricultural production; identification and planting of flood resistant crops or adjustment of planting season, if possible, to avoid coinciding with cyclone and flood season;

--- Development of family savings programs to establish cash reserves;

--- Identification and strengthening of local organizations that serve as coping mechanisms;

--- Reforestation and range management to increase absorption and reduce rapid runoff in mountainous areas.

B. Preparedness

Preparedness activities include:

--- Developing a disaster preparedness plan to sequence the activities and responsibilities of each participant;

--- Developing warning and evacuation procedures for people threatened by floods;

--- Training for first aid and trauma care, and maintaining stocks of necessary medical supplies;

--- Establishing an emergency communication system as well as public service messages regarding evacuation, health, safety, and security.

C. Emergency Response

1. Initial response by local authorities after a cyclone includes:

    --- Evacuation;

    --- Search-and-rescue;

    --- Medical assistance;

    --- Disaster assessment;

- --- Provision of short-term food and water;
- --- Water purification;
- --- Epidemiological surveillance;
- --- Provision of temporary lodging and, depending upon the climate, blankets.

2. Initial response by foreign aid organizations includes:

- --- Cash;
- --- Assistance in reopening roads;
- --- Re-establishing communications contact with remote areas;
- --- Disaster assessment;
- --- Assistance with water purification.

3. Secondary response by local authorities after a cyclone includes:

- --- Repair and/or reconstruction of infrastructure, housing and public buildings;
- --- Creation of jobs;
- --- Assistance to agricultural recovery (loans, seeds, farm equipment, animals) as well as to small businesses, fishermen, etc.

4. Secondary response by foreign agencies includes:

- --- Repair and/or reconstruction of housing;
- --- Creation of jobs;
- --- Credit;
- --- Technical assistance;
- --- Assistance to recovery of agriculture, small businesses and institutions.

LESSONS FROM PAST CYCLONES

A. Outbreaks of cholera do not follow cyclones. Cholera must be endemic to a community beforehand.

B. Waterborne diseases do not increase as a result of cyclones.

C. Massive food aid is rarely required after a cyclone.

D. Used clothing is almost never needed, is usually culturally inappropriate and, though accepted by disaster victims, it is almost never worn.

E. Blankets can be useful but, if needed, can be found locally and do not need to be imported.

F. Assistance by outsiders is most effective in the reconstruction period, not the emergency phase.

G. Most needs are met by the victims themselves or their local governments.

H. In general, victims do not respond to disasters with abnormal behavior. Cyclones do not incite panic, hysteria or rioting.

I. Cyclone relief and reconstruction programs should be integrated with long-term development programs.

J. When properly executed, reconstruction assistance can provide a strong stimulus to recovery and a base for future development work.

K. Reconstruction programs should seek to reduce vulnerability to future disasters.

L. Re-establishment of the local economy, income security and agriculture are usually more important to cyclone victims than material assistance.

M. Churches, schools and other large buildings that are often designated as cyclone shelters are usually not safe. The number of deaths attributed to destroyed or flooded shelters is alarming. Most experts agree that the best alternative is adequate warning and evacuation of threatened areas.

OPPORTUNITIES AND APPROPRIATE ROLES FOR PEACE CORPS VOLUNTEERS

There are many ways in which Peace Corps Volunteers can participate in cyclone mitigation, preparedness, response, or recovery operations as part of their normal work. There are also many specific activities that would be appropriate for full- or part-time assignments. Some specific opportunities in mitigation and/or reconstruction include:

A. Public Awareness. Volunteers can be trained and provided with appropriate materials to conduct public awareness workshops on the nature and risk of a cyclone and what can be done to mitigate and prepare for it.

B. Housing Improvement. PCV engineers, architects or skilled builders can help families to strengthen existing structures and make them more wind resistant. Much can be done at little cost, using locally available materials.

C. Housing Reconstruction. PCVs can provide technical assistance to cyclone victims, especially building tradesmen, to improve the performance of new structures. Volunteers can provide information about how to build safer houses, safe site selection procedures; and improved building components and techniques. They can work to improve tradesmen's building skills and capabilities, and introduce ways to modify traditional buildings to make them safer.

D. Building Surveys. PCV engineers or architects, if properly trained, can assess the survivability of large buildings (schools, churches, etc.) that are commonly designated as cyclone shelters. If these structures are unsafe, PCVs can then work with the community to strengthen the structures or, if this is not feasible, to identify alternative protection strategies (i.e. evacuation).

E. Preparedness Planning. PCVs can work with the community to develop a local disaster preparedness plan. Any preparedness activity, no matter how small, can potentially save lives and reduce property damage. A "plan" could be a simple checklist of appropriate actions with the assignment of personnel responsible for carrying out the activities.

F. Food and Agricultural Planning. Peace Corps Volunteers promoting vegetable gardening can introduce flood resistant crops that are culturally acceptable. Agronomists can work with farmers to select alternative farming patterns or flood and wind resistant crops that mature at times of low risk.

G. Harvest Protection. Appropriate technology specialists can help small farmers build ferrocement or other appropriate strong grain storage facilities to help protect harvests until they are sold.

H. Reforestation and Watershed Management. PCV foresters can help reduce vulnerability through reforestation efforts designed to reduce rapid rain runoff and subsequent flooding. On lowlands PCVs can promote the strategic planting of trees to serve as windbreaks. Better animal husbandry techniques and management of grazing can help reduce flooding in the upper reaches of a watershed. PCVs can promote use of fuel-efficient woodstoves to lessen deforestation pressures which can lead to severe flooding.

I. Economic Protection. Economic development specialists can promote the establishment of savings-and-loan programs by cooperatives and other microenterprises to diversify income and economic security for people threatened with a disaster.

J. Assistance to Other Agencies. PCVs can assist both local and international aid agencies by monitoring and helping to evaluate long-term reconstruction and recovery programs.

Paper originally published in The Potential Contribution of Peace Corps to Disaster Preparedness in Africa, Briefing papers prepared by INTERTECT for the AID/Peace Corps Disaster Preparedness Conference, Mombasa, Kenya (March 1983).

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EARTHQUAKES

Earthquakes are one of the most dangerous and destructive forms of natural hazards. They strike with sudden impact and little warning. They may occur at any time of day or on any day of the year. An earthquake can devastate an entire city or a region of hundreds of square kilometers. They can reduce buildings to a pile of rubble in seconds, killing and injuring their inhabitants.

WHAT CAUSES EARTHQUAKES

The regions of the world where earthquakes occur are characterized by certain geological aspects. The earth's crust is broken into a series of blocks or "plates" that are separated by deep fractures called faults. Faults form lines of weakness in the masses of rock at the earth's surface. Pressures build up below the surface which eventually force a sudden shift between two of these blocks. This sudden shift is the earthquake.

Why these pressures build up and cause the movements is explained by the theory of continental drift or "plate tectonics". Briefly, this theory holds that all the earth's land area once was a single mass. This mass broke apart, and the pieces began drifting. Wherever plates meet there is a high degree of earthquake activity or "seismicity".

The fault movement, at these meetings of plates, is the result of elastic rebound, the slow build-up and sudden release of strain within masses of rock. The place at which the stresses are released is known as the focus of an earthquake. From this point, mechanical energy is initiated in the form of waves that radiate in all directions through the earth. When this energy arrives at the earth's surface, it forms secondary surface waves. The frequency and amplitude of the vibrations produced at the surface, and thus the severity of the earthquake, depend on the amount of mechanical energy released at the focus, the distance and depth of the focus, and the structural properties of the rock or soil on or near the surface.

EFFECTS OF EARTHQUAKES

A. Primary Effects

The onset of a large earthquake is initially signaled by a deep rumbling, followed shortly by a series of violent motions in the ground. Often the ground fissures or cracks, and there can be large permanent displacements horizontally -- sometimes as much as 10-15 meters.

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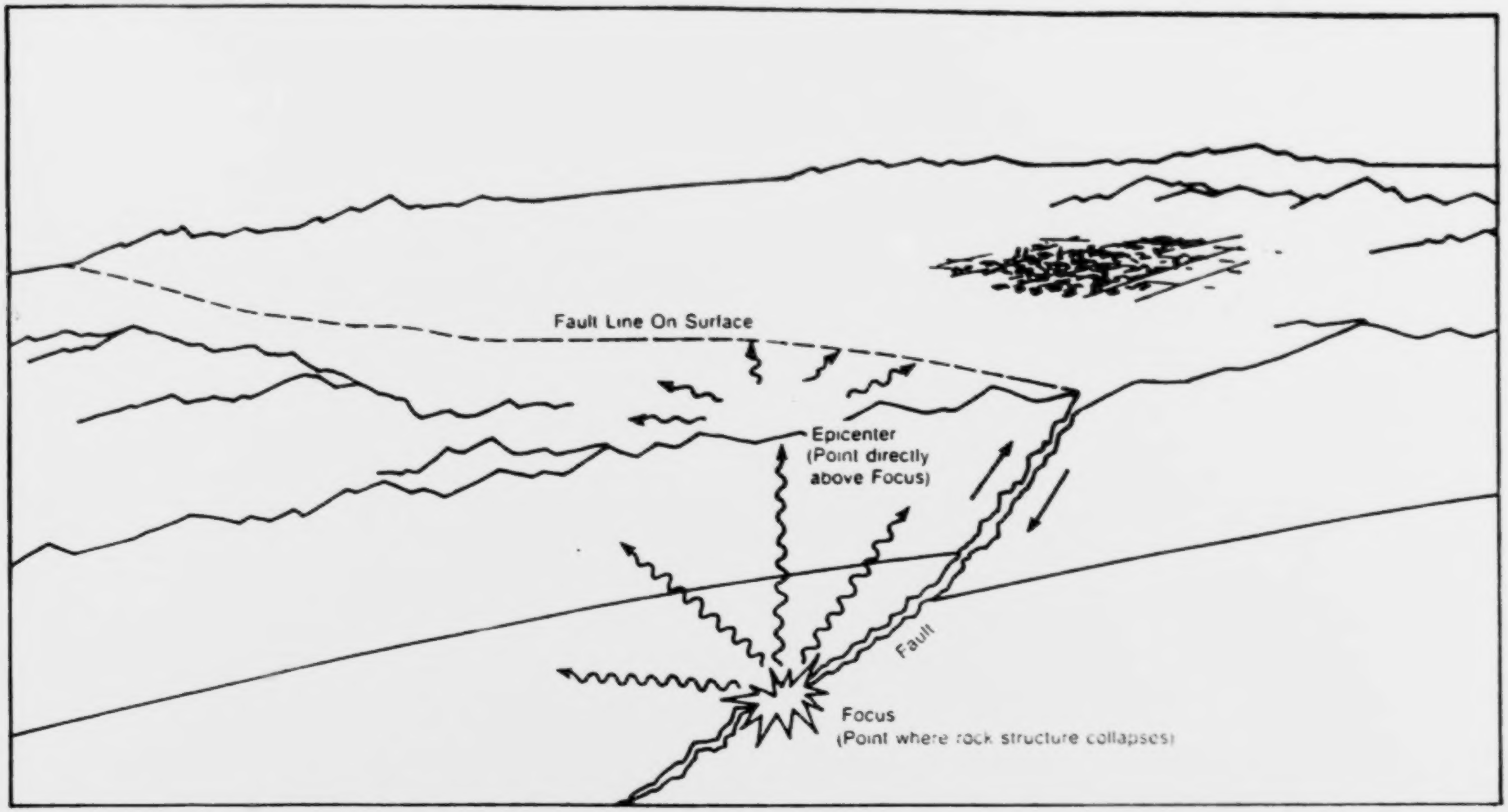
Fault Line On Surface
Epicenter
(Point directly above Focus)
Fault
Focus
(Point where rock structure collapses)

DESCRIPTION OF AN EARTHQUAKE

Motion of the earth's plates causes increased pressure at faults where the plates meet. Eventually the rock structure collapses and movement occurs along the fault. Energy is propagated to the surface above and radiates outward. These waves of motion in the earth's crust shake landforms and buildings, causing damage

As the vibrations and waves continue to move through the earth, structures on the earth's surface are set in motion. Each type of structure responds differently, depending on the type of materials of which it is made. When the waves strike, the earth begins to move backward and forward along the same line. The lower part of a building on the earth's surface immediately moves with the earth. The upper portion, however, initially remains at rest; thus the building is stretched out of shape. Gradually the upper portion tries to catch up with the bottom; but as it does so, the earth moves in the other direction causing a "whiplash" effect, speeding up the top of the building, and creating a vibration known as resonance. The resonance can cause structural failure in itself, or adjacent buildings having different response characteristics (caused by different building materials) can vibrate out of phase and pound each other. The walls of buildings without adequate lateral bracing frequently fall outward, allowing the upper floors or roof to collapse into the inside of the structure.

Another primary effect is known as liquefaction. Loose sandy soils with a high moisture content separate when shaken by an earthquake. The water then moves upward, turning the surface into a consistency much like that of quicksand. Heavy structures resting on these soils will slowly sink into the ground.

B. Secondary Effects

Often as destructive as the earthquake itself are the resulting secondary effects such as landslides, fires, tsunamis, and floods. Landslides are especially damaging and often account for the majority of lives lost.

Of less concern, except for countries in the Pacific Basin, are tsunamis. A tsunami is a large seawave caused by an earthquake abruptly lifting the ocean floor. The waves move outward at a high velocity and can cross thousands of kilometers before they run up on shore. At sea, their low wave height gives little evidence of their existence; however, as they approach land, their velocity decreases and their height increases. In this way a 5-meter crest moving at 600 kph in the open ocean becomes a devastating 30-meter-high wave moving at 50 kph when it reaches shore.

The risk of fire immediately following an earthquake is often high due to the breakage of electrical lines and gas mains. In recent years, devices have been installed in most of the world's major cities that shut these services down automatically if an earthquake strikes. Yet the threat still exists in many smaller cities and the squatter settlements of larger cities where open fires are used for cooking, heating and lighting.

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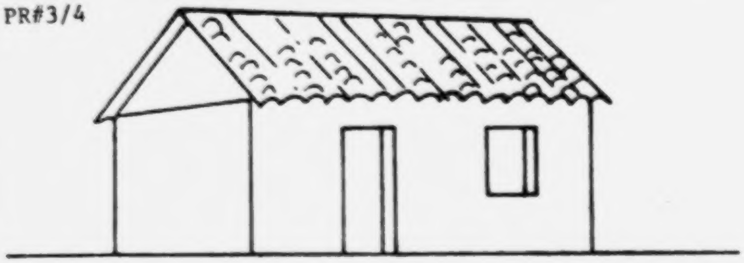
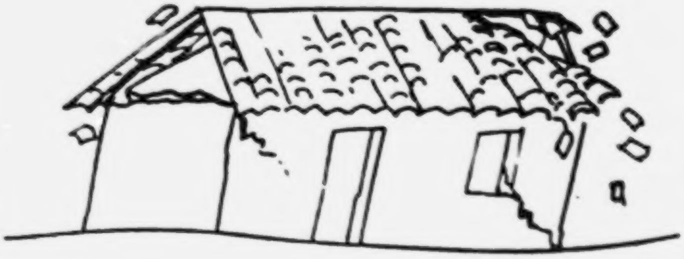
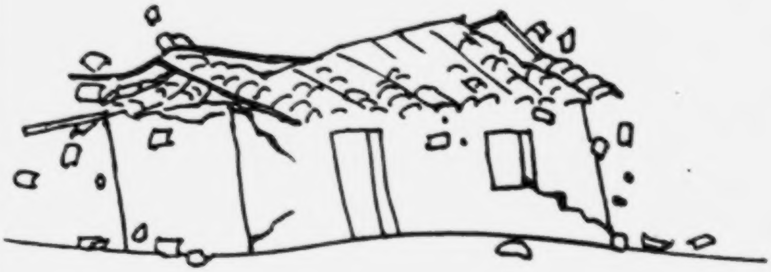
HOW AN EARTHQUAKE DAMAGES A HOUSE



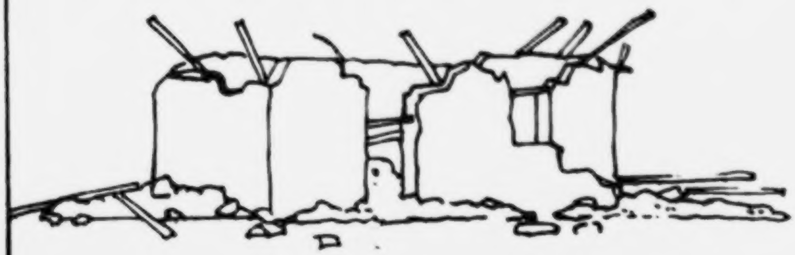
A vulnerable house consists of heavy materials stacked in place without a continuous frame for reinforcement.



The house moves with the motion of the earth during an earthquake, creating new stresses in the structure.



Built to withstand only normal downward gravitational forces, the house now is subjected to complex lateral forces.



As building components fall apart, the roof and walls collapse, burying occupants beneath the rubble.

C. Impact of Earthquakes

The principal concern about an earthquake is the impact it has on the built environment and its inhabitants. Approximately 90 percent of the loss of life in all earthquakes is the result of structural collapse. There are five primary elements that influence damage to man-made structures:

1. Strength of the earthquake waves reaching the surface. The stronger the fault movement, the stronger the earthquake waves.

2. Length of earthquake motion. The fluctuating series of tremors can last from 10 seconds to a minute or more. It is the cumulative effect of this motion that works on structural walls and is the usual cause of collapse.

3. Proximity to the fault. Generally there is greater danger closer to the fault than further away. However, there are other important considerations such as structural inadequacies and types of ground condition.

4. Geologic foundation. Structures built on solid rock fare better than those built on softer ground or, worse yet, those built partly on solid ground and partly on soft ground or fill -- a condition commonly found on hillsides.

5. Building design. To resist damage in an earthquake, a building must be adequately braced, have structural continuity with secure anchoring and bonding of all elements, be well balanced and tied together.

Until recently, the great loss of life and property was unavoidable. However, now that more is known about the nature of earthquakes and their effects, we have engineering techniques to make new structures reasonably earthquake-resistant at a small additional cost and are rapidly developing techniques to make older buildings safer. A high loss of life from the collapse of weak buildings is now avoidable, and even structures made of materials such as adobe and brick in the poorest settlements of the Third World can be made relatively safe, thus substantially reducing the loss of life.

IMPACT ON DEVELOPMENT

Widespread destructive earthquakes can have a significant impact on economic development. Because they damage man-made structures, reconstruction costs can be substantial. When thousands of buildings must be replaced, the costs can exceed the national budget. This means that reconstruction will compete with development projects for money and other resources. To reduce costs, emphasis must be placed on the private sector and especially on self-help activities. This emphasis provides many opportunities to expand development. Technical assistance in self-help construction, credit and public works can all contribute to improving people's capabilities to deal with their own needs.

In their rush to help survivors, relief agencies often offer a wide range of services and relief materials. Unless caution is exercised, expectations can be raised that can actually become a disincentive to self-help and local initiative. This is especially true in the housing sector. (This is one of the reasons why more enlightened relief agencies provide building materials instead of tents as emergency shelter. Materials imply that the emphasis will be on self-help.).

Earthquakes also heighten awareness of social stratification. It is usually obvious that it is the poor, living in low-quality buildings, who suffer the greatest number of deaths, injury and loss of property. This awareness has been called "instant consciousness-raising" and can be a powerful force for change if properly directed. If ignored, adverse political consequences can result. It is not uncommon to see an increase of land invasions, major shifts of population from rural to urban areas, and a decline in the number of skilled workers in rural areas in the aftermath of an earthquake. How governments and development agencies respond to these changes can have a major impact on future development.

MYTHS AND LESSONS FROM PAST DISASTERS

The study of geology, specifically the nature and causes of earthquakes, has been relatively recent. It is, therefore, understandable that people throughout history have created their own explanations for the occurrence of earthquakes.

Frequently, traditional cultures believe that earthquakes are caused by a god. They believe their god uses an earthquake to express displeasure for some fault or sin of the community. Other people claim there is a correlation between earthquakes and weather patterns. More current speculation has suggested that the explosion of nuclear bombs provokes earthquakes.

These misconceptions, in turn, affect what people think they can do about earthquakes. For example, they may simply resign themselves to suffer the "act of God" if that is God's intention.

Examining past earthquakes has, of course, demonstrated many lessons:

A. Because people often assume there is nothing they can do to avoid the impact or destruction of an earthquake, there is a tendency for survivors to reconstruct buildings in the same manner (and with the same degree of danger) as the pre-disaster buildings.

B. Designs that affect reconstruction planning are usually made in the first month following the earthquake. This means that technical assistance and improvements must be provided soon after the quake in order to have an effect.

C. Most survivors will build an emergency shelter from the rubble of their house. They prefer these shelters to tents because the makeshift houses provide more protection and serve as a means of protecting recoverable building materials.

D. Earthquakes and the threat of continuing tremors rarely are sufficient reason to evacuate an affected area.

E. Health threats in the aftermath are grossly exaggerated. Communicable diseases almost never "break out" unless people are forced to evacuate an area and move into camps.

F. Reconstruction always takes longer than estimated. Full recovery may take 10 years or more.

Analysis shows that many of the losses from earthquakes can be avoided. Various techniques for their avoidance will be discussed below.

PRE-DISASTER ACTIVITIES

A. Earthquake Mitigation

Fortunately, a great deal can be done to prevent earthquakes from becoming disasters. First, the general public as well as engineers, planners, politicians and others, need to understand the nature of earthquakes. Based on that understanding, a decision and various levels of commitment are needed to implement measures to mitigate earthquake damage.

The first level of commitment requires that government and policymakers create strategic development and investment programs. A comprehensive approach would establish geographic zones and a target population.

A second level is design of an extensive public awareness program. This program informs the public about the earthquake hazard and illustrates what can be done to prevent a disaster.

The third level is a technical assistance program. This could include architectural and engineering assistance in improved building design, construction, and siting; training local residents in these techniques; and conducting projects that demonstrate the nature of these techniques.

The implementation of these mitigation measures must be preceded by collection of background information. One primary task is to identify where earthquakes are likely to occur and the relative probability that they will occur; this is referred to as risk mapping.

The second task is to identify communities that occupy high risk sites. In these, the various types of structures should be studied to determine which are likely to fail in an earthquake. This is called vulnerability mapping and identifies specific populations in danger.

The next task is to conduct a survey of construction methods, techniques and materials to determine ways to improve the buildings. This should be done with an understanding of the overall economic and cultural process by which houses or public buildings are built.

There are many ways to reduce earthquake damage. Possible actions include:

1. developing construction techniques that are seismic resistant;
2. conducting a program to introduce improved construction techniques to the building industry and the general public;
3. determining which sites are safe for construction through analysis of the soil type and geological structure;
4. instituting incentives to remove unsafe buildings and buildings on unsafe sites or, more probable, to upgrade their level of safety;
5. instituting incentives to encourage future development on safer sites and safer methods of construction through:
    a. land use controls (zoning);
    b. building codes and standards and means of enforcing them;
    c. favorable taxation, loans or subsidies to qualifying building methods and sites;
    d. land development incentives.
6. reducing possible damage from secondary effects by:
    a. identifying potential landslide sites and restricting construction in those areas;

b. installing devices that will keep breakages in electrical lines and gas mains from producing fires;

c. verifying the capability of dams to resist earthquake forces, and upgrading as necessary.

B. Earthquake Preparedness

Vulnerable communities should institute preparedness programs. Preparedness includes educating the public about what they should do in case of an earthquake and preparing public officials and services to react to the emergency. Activities include:

1. training teams for search and rescue operations;
2. training teams for disaster assessment;
3. identifying safe sites where people living in areas threatened by landslides in secondary tremors could be relocated;
4. training adequate personnel in trauma care;
5. maintaining stocks of trauma-related medical supplies;
6. reviewing the structural soundness of facilities that are essential for the operation of disaster response such as hospitals, fire stations, government buildings, communications installations; upgrading them as necessary;
7. preparing plans and necessary equipment for alternative water supply if the current system is vulnerable;
8. preparing plans for clearing streets on a priority basis (to provide emergency access);
9. preparing emergency communication systems as well as messages to the public regarding matters of their health, safety and security;
10. training teams to determine if buildings are safe for reoccupancy.

POST-DISASTER ACTIVITIES

A. Earthquake Response

The immediate impact of an earthquake affects virtually all sectors of the community. Initial response by local authorities should include implementing the activities identified in the preparedness stage. Initial emphasis will be on search and rescue of the victims, attempting as far as feasible to account for all members of the affected population. Second, provide emergency medical assistance. There will be a high incidence of surgical needs during the first 72 hours; additional medical needs will fall off sharply after that time. Contrary to myth, there are no actual immediate epidemiological threats or patterns of disease resulting directly from an earthquake.

Third, conduct a damage and needs assessment. The local government as well as international donors need to know as quickly as possible the scale of the disaster and what sort of assistance (and how much) is needed.

Fourth, provide relief to the survivors. Response can take several forms. Of the greatest value is cash, allowing survivors and local agencies discretion to focus resources where the most urgent needs are. International donors can assist in reopening roads, reestablishing communications, making contact with remote areas, conducting disaster assessment, and providing building materials for reconstruction. The popularly known forms of foreign relief such as food, blankets and clothes are totally inappropriate.

In all emergency activities it is of prime importance that information for the public about what they should do and where they can go for services be immediately available and accurate, and that decision-makers act according to priorities.

B. Earthquake Rehabilitation, Reconstruction and Recovery

At the end of the emergency period, a transition to long-term recovery occurs. Local authorities should concentrate their assistance in the following areas:

1. repair and reconstruction of "lifelines", i.e. water, sewer, electrical services and roads;

2. technical, material and financial assistance for the repair and reconstruction of housing and public buildings;

3. economic programs that create jobs to help rejuvenate the economy;

4. financial assistance to survivors, including lines of credit and assistance to businesses, to enable them to participate in recovery efforts.

International donors will be able to provide assistance in all of these same activities. The most cost-effective support they can provide is technical and financial assistance.

The following are some lessons for planning and administration of reconstruction programs:

--- Aid should not be provided in such a way that it inhibits the recovery process and creates dependency relationships between victims and donors.

--- The hierarchical structure of donor organizations should facilitate, not inhibit, the flow of information on the real needs of victims to the decision-makers.

--- Reconstruction must be carried out by properly-trained program administrators and technicians, not well-intended lay-persons.

--- Donor organizations need to be cautious about providing emergency shelter; rarely is it an appropriate form of aid. Even less likely is the appropriateness of a high technology, imported emergency shelter design.

OPPORTUNITES AND APPROPRIATE ROLES FOR PEACE CORPS VOLUNTEERS

There are many ways for Peace Corps Volunteers to participate in earthquake mitigation, preparedness, response or recovery. All Volunteers can participate in public awareness activities in earthquake-prone communities. There are also many specific activities that are appropriate for full or part-time Volunteer assignments. These include:

A. Housing Improvement. Peace Corps engineers and architects, or PCVs with construction skills, can help plan and execute programs to improve local housing to an earthquake-resistant standard in both mitigation as well as reconstruction programs.

B. Site Selection. City planners, geologists and geographers can help urban governments conduct risk and vulnerability analyses and can advise urban dwellers about safe siting of their houses.

C. Structural Surveys. Peace Corps engineers and architects can assist in assessing building safety before and after earthquakes.

D. Economic Mitigation. Economic development specialists can encourage the establishment of lending institutions to provide money for housing improvement and encourage the poor to establish cash reserves for possible emergencies. Co-ops are a major source of reconstruction loans to the poor who often cannot qualify for other financial assistance.

E. Emergency Response. All PCVs can help in an emergency. Roles might include:

--- search-and-rescue

--- distribution of relief

--- distribution of shelter materials

--- disaster assessment

--- needs assessment

--- translation services for foreign disaster officials

Paper originally published in The Potential Contribution of Peace Corps to Disaster Preparedness in Africa, Briefing papers prepared by INTERTECT for the AID/Peace Corps Disaster Preparedness Conference, Mombasa, Kenya (March 1983).

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FLOODS

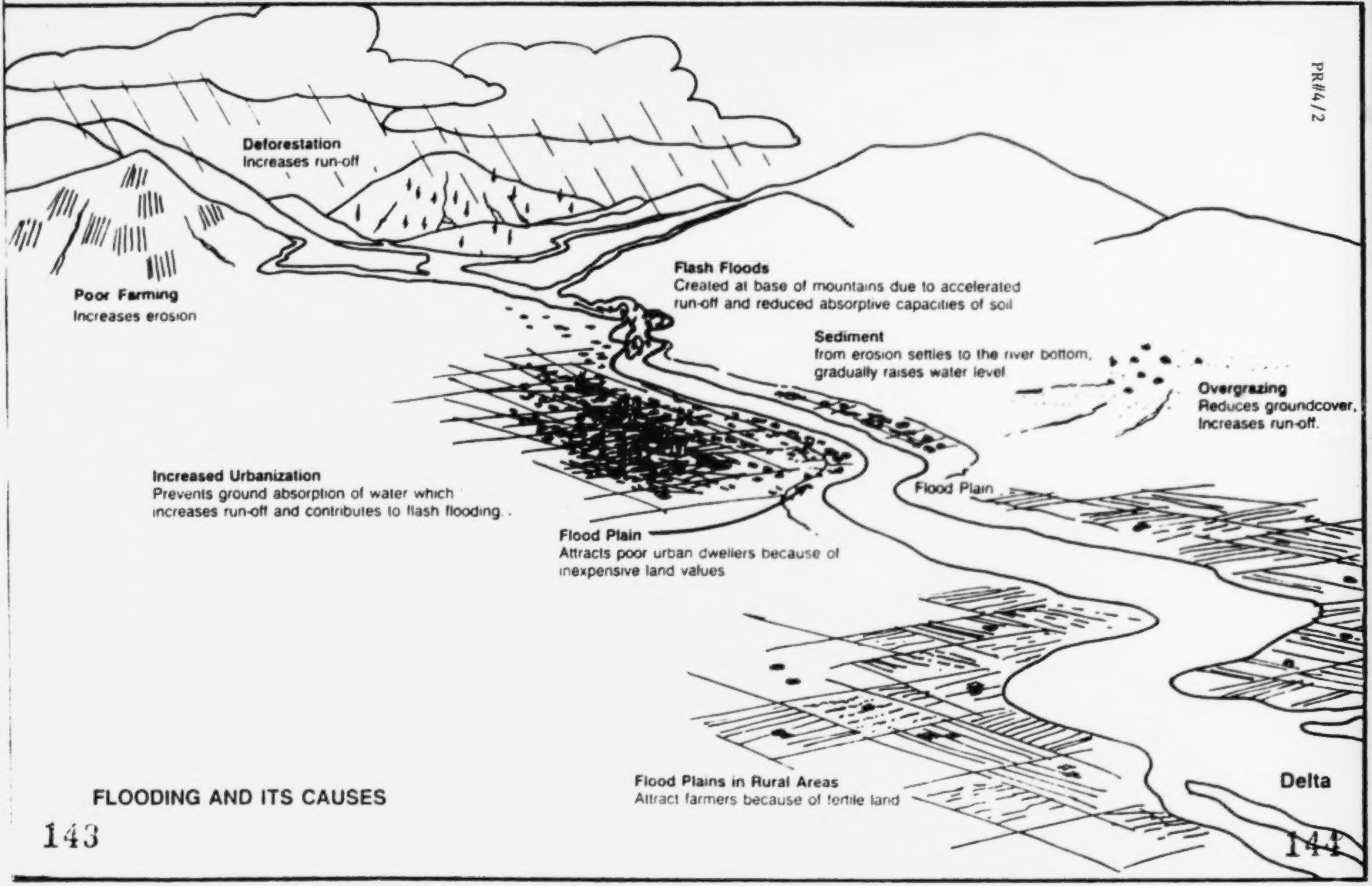
DESCRIPTION OF THE THREAT

Floods are destructive natural hazards that cause loss of life and extensive social and economic disruption. Each year, floods take an increasing number of lives and property. In fact, flooding is the one natural hazard that is becoming a greater threat rather than remaining constant or being reduced. Floods are caused not only by rain but also by human changes to the surface of the earth such as farming, deforestation and urbanization. These actions increase the runoff from rains; thus storms that previously would have caused no flooding today inundate vast areas.

Not only do we contribute to the causes of floods, but reckless building in vulnerable areas, poor watershed management, and failure to control the flooding also help create the disaster condition. Ecologists have recently found evidence that human endeavors may be directly affecting the weather conditions that produce extensive and heavy rains. Irrigation of dry lands creates moisture conditions that contribute to increased humidity and evaporation, which in turn lead to increased rainfall. This is particularly heightened in desert areas where large lakes are built to provide water either for irrigation or for nearby settlements.

Flooding is any abnormally high streamflow that overtops the natural or artificial banks of a stream. Flooding is a natural characteristic of rivers. The flood plains are normally dry land areas and are an integral part of a river system that acts as a natural reservoir and temporary channel for flood waters. If more runoff is generated than the banks of a stream channel can accommodate, the water will overtop the stream banks and spread over the flood plain. The ultimate factor of damage, however, is not the quantity of water being discharged, but the stage of elevation of the water surface. Furthermore, floods can form where there is no stream, as for example when abnormally heavy precipitation falls on flat terrain at such a rate that the soil cannot absorb the water or the water cannot run off as fast as it falls.

Flash floods are local floods of great volume and short duration. A flash flood generally results from a torrential rain or "cloudburst" on relatively small and widely-dispersed streams. Runoff from the intense rainfall results in high flood waves. Discharges quickly reach a maximum and diminish almost as rapidly. Flood flows frequently contain large concentrations of sediment and debris. Flash floods also result from the failure of a dam or from the sudden breakup of an ice jam. Flash floods are particularly common in mountainous areas and desert regions but are a potential threat in any area where the terrain is steep, surface runoff rates are high, streams flow in narrow canyons, and severe thunderstorms prevail.



Deforestation
Increases run-off

Poor Farming
Increases erosion

Flash Floods
Created at base of mountains due to accelerated run-off and reduced absorptive capacities of soil

Sediment
from erosion settles to the river bottom, gradually raises water level

Overgrazing
Reduces groundcover, Increases run-off.

Increased Urbanization
Prevents ground absorption of water which increases run-off and contributes to flash flooding.

Flood Plain

Flood Plain
Attracts poor urban dwellers because of inexpensive land values

Flood Plains in Rural Areas
Attract farmers because of fertile land

Delta

FLOODING AND ITS CAUSES

Riverine floods are caused by precipitation over large areas or by melting of the winter's accumulation of snow, or by both. These floods differ from flash floods in their extent and duration. Whereas flash floods are of short duration in small streams, riverine floods take place in river systems whose tributaries may drain large geographic areas and encompass many independent river basins. Floods on large river systems may continue for periods ranging from a few hours to many days. Flood flows in large river systems are influenced primarily by variations in the intensity, amount and distribubution of precipitation. The condition of the ground (amount of soil moisture, seasonal variations in vegetation, depth of snow cover, imperviousness due to urbanization, etc.) directly affects runoff.

PRIMARY AND SECONDARY EFFECTS

Floods are natural hazards that are not, in and of themselves, disasters. Rather, floods are agents or hazards that transform a vulnerable condition into a disaster. The vulnerability of a human settlement is determined by its exposure to flooding. This is determined by siting, soil conditions, absorptive capacity of the watershed, and the capacity of streams to carry runoff. Urban and rural communities sited on flood plains of rivers or streams are the communities most at risk.

The most important determinant of vulnerability is the level of poverty and underdevelopment of a particular group. It is the poor who suffer most in disasters. Poor people usually live in weaker houses which in turn are usually located in the most undesirable and most vulnerable areas. Furthermore, dramatic increases in population size, distribution and density increase disaster risk. Urban slums and squatter settlements grow at about twice the average urban rate. Land tenure is also a determinant of vulnerability, especially where there is a scarcity of arable or developed land and the poor farmers must engage in agriculture on hazardous land.

Floods kill people. The number of deaths is significantly higher in developing countries where communications are poor and warning systems and evacuation plans are inadequate. Furthermore, it is expected that the number of deaths will increase as population pressures force people into more vulnerable areas such as lowlying agricultural areas or overcrowded urban slums on flood plains.

Floods can also damage human settlements, force evacuations, damage certain crops (especially tubers), damage food stocks, strip farmland, wash away irrigation systems, erode large areas of land or make them otherwise unusable, and may change the course of streams and rivers. Floods may also have a beneficial effect by depositing silt in some downstream areas.

A secondary effect of heavy rainfall is mudslides. Heavy rains quickly superssaturate hillsides that have been deforested or stripped for farming and can cause immense landslides. Large loss of life may occur in these massive mudslides, especially in squatter settlements located in floodplains.

HEALTH-RELATED EFFECTS

In floods, deaths usually exceed injuries. Surgical needs are low and are generally only during the first 72 hours. Floods may bring actual immediate threats of waterborne diseases; and they can create conditions that promote secondary threats of waterborne and vectorborne diseases.

IMPACT ON DEVELOPMENT

Widespread floods can have a significant effect on the long-term economic growth of the affected region. Indirect and secondary effects on the local and national economy of the area may include reduction in family income, decline in the production of business and industrial enterprises, inflation, unemployment, increase in income disparities, and decline in national income. In addition, relief and reconstruction efforts often compete with development programs for available funds. In countries where floods occur frequently, they can create an enormous financial burden.

The loss of crops and the need to find alternate sources of income have often caused small-scale migrations of farmers and skilled workers from rural areas to cities. Once established in a city, few return to their homes or farms.

Small marginal farms (two acres or less) usually cannot survive economically following a major flood. Farmers are often forced to sell their land because they cannot afford to rehabilitate it. This may result in a substantial increase in the number of people migrating to urban areas, and thus a related housing shortage.

PRE-DISASTER PLANNING ACTIVITIES

The majority of the deaths and destruction created by floods are largely preventable. A great deal can be done to lessen the impact of a disaster. First, though, the general public as well as engineers, planners, politicians and others need to understand the nature of the hazard. Based on that understanding, a decision and a commitment need to be made to implement mitigation measures to reduce flood damage. Reducing the harmful effects of a flood requires actions on three fronts: reducing the vulnerability of the physical settlements and structures in which people live; reducing the vulnerability of the economy; and strengthening the social structure of a community so that coping mechanisms can help absorb the impact of a disaster and promote rapid recovery.

The first step in vulnerability reduction for human settlements is to identify the high-risk areas. This is done by relating a natural hazard such as a flood to the terrain and to the probability that such an event will occur. This activity is known as risk mapping. Flood risk mapping, for example, would indicate the areas likely to be covered by water during floods of given magnitude.

The second step in vulnerability reduction is to identify those communities that are particularly susceptible to damage or destruction. This is done by relating risk to human settlements and their structures.

The third step is selection of a vulnerability reduction strategy. Specific mitigation activities may include:

--- Development of extensive public awareness programs to inform the public about flood hazards and illustrate what can be done to prevent a disaster;

--- Land-use zoning to control development;

--- Construction of protective works, such as embankments, to protect from flooding;

--- Restrictive development regulations to ensure that any development meets certain standards that take into consideration the threat to the site;

--- Land swaps, which would provide alternatives to development of the site;

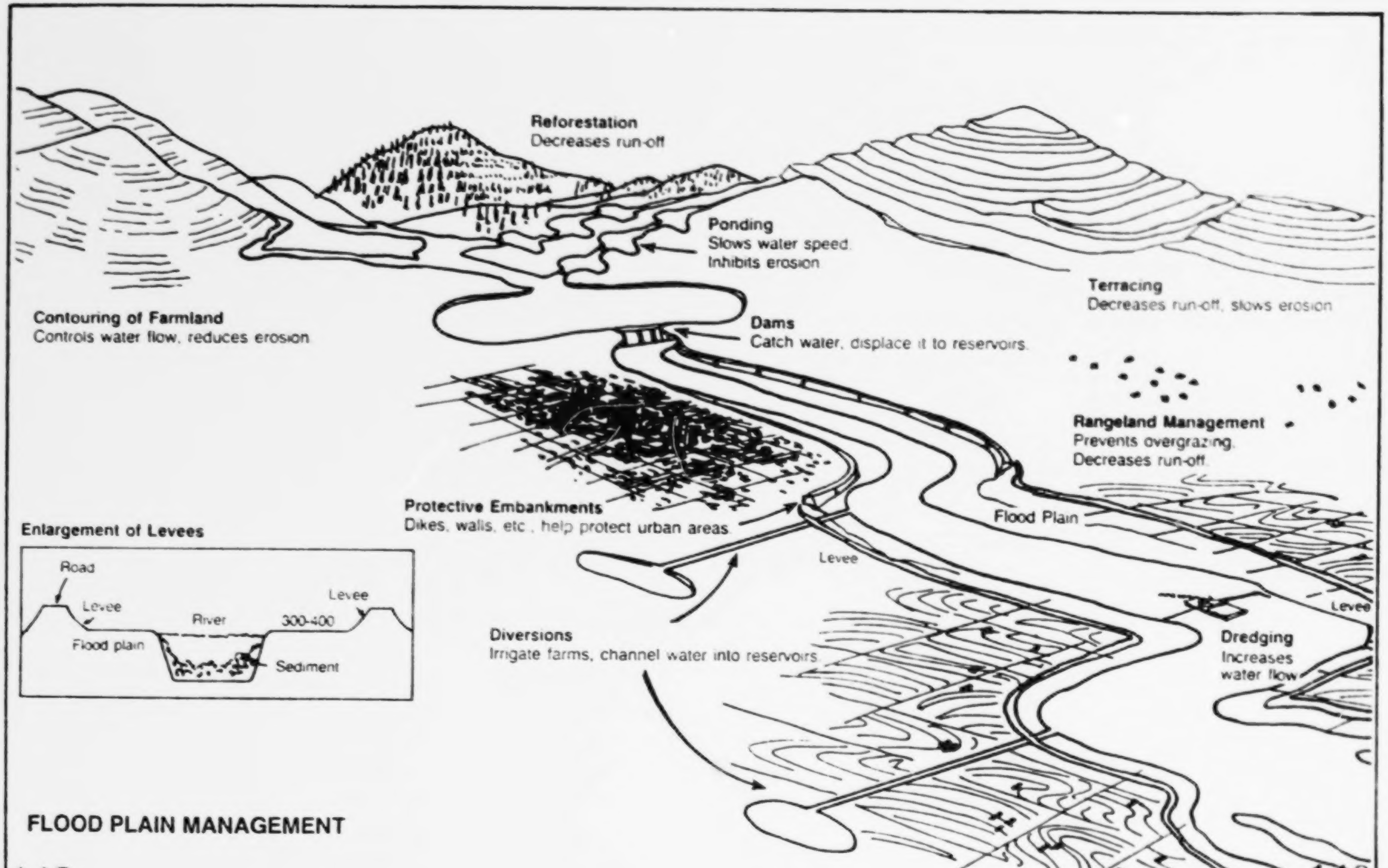
--- Establishment of incentives to encourage future development on safer sites and safer methods of construction (such as favorable taxation, loans or subsidies to those qualifying in terms of building methods or sites);

--- Diversification of agricultural production; identification and planting of flood resistant crops or adjustment of planting season, if possible, to avoid coinciding with the flood season;

--- Establishment of cash and food reserves;

--- Reforestation, range management and animal grazing controls to increase absorption and reduce rapid runoff;

--- Construction of raised areas or buildings specified as refuges if evacuation is impossible.


Reforestation
Decreases run-off
Ponding
Slows water speed.
Inhibits erosion
Terracing
Decreases run-off, slows erosion
Contouring of Farmland
Controls water flow, reduces erosion
Dams
Catch water, displace it to reservoirs.
Rangeland Management
Prevents overgrazing.
Decreases run-off.
Protective Embankments
Dikes, walls, etc., help protect urban areas.
Flood Plain
Enlargement of Levees
Road
Levee
River
300-400
Levee
Flood plain
Sediment
Levee
Levee
Diversions
Irrigate farms, channel water into reservoirs.
Dredging
Increases
water flow

FLOOD PLAIN MANAGEMENT

PR#4/6

FLOOD PREPAREDNESS

Communities that are vulnerable to inundation from floods should institute flood preparedness programs.

A partial list of preparedness activities includes:

--- Developing a disaster preparedness plan that sets out the sequence of activities and the responsibilities of each participant;

--- Developing warning and evacuation procedures for people in vulnerable areas;

--- Training adequate personnel in first aid and trauma care, and maintaining stocks of necessary medical supplies;

--- Preparing communication systems as well as messages to the public regarding their health, safety, and security;

--- Reviewing the siting of critical facilities such as hospitals, government buildings, communications installations, etc.

POST-DISASTER ACTIVITIES

The following are typical post-disaster responses.

A. Initial response by local authorities:

--- Evacuation;

--- Search-and-rescue;

--- Medical assistance;

--- Disaster assessment;

--- Provision of short-term food and water;

--- Water purification;

--- Epidemiological surveillance;

--- Provision of temporary lodging and, depending upon the climate, blankets.

B. Initial response by foreign agencies:

- --- Cash;
- --- Assistance in reopening roads;
- --- Re-establishing communications contact with remote areas;
- --- Disaster assessment;
- --- Assistance with water purification.

C. Secondary response by local authorities:

- --- Repair and/or reconstruction of infrastructure, housing and public buildings;
- --- Creation of jobs;
- --- Assistance to agricultural recovery (loans, seeds, farm equipment, animals) as well as to small businesses, fishermen, etc.

D. Secondary response by foreign agencies:

- --- Repair and/or reconstruction of housing;
- --- Creation of jobs;
- --- Credit;
- --- Technical assistance;
- --- Assistance to agricultural recovery, small businesses and institutions.

LESSONS LEARNED FROM PAST DISASTERS

A. Floods do not cause outbreaks of cholera. Cholera must be endemic to the community before the flood strikes.

B. Massive long-term food aid is rarely required after a flood, although food distribution systems may need to be set up immediately after a flood in the affected area.

C. Used clothing is almost never needed; it is usually culturally inappropriate and, though accepted by disaster victims, it is almost never worn.

D. Blankets can be useful but, if needed, can be found locally and do not need to be imported.

E. Flood mitigation and reconstruction programs must be integrated with long-term development programs.

F. Reconstruction assistance in agriculture can provide a strong stimulus to recovery and a base for positive changes.

G. Reconstruction programs should seek to reduce the vulnerability of communities.

H. Re-establishment of the local agriculture, economy and job security is more important to flood victims than material assistance.

OPPORTUNITIES AND APPROPRIATE ROLES FOR PEACE CORPS VOLUNTEERS

There are many ways for Peace Corps Volunteers to participate in flood mitigation, preparedness, response, or recovery. Some specific opportunites appropriate for PCVs include:

A. Public Awareness. Almost any PCV can be trained and provided with appropriate materials to conduct public awareness workshops on the nature and risk of flooding and what can be done to mitigate and prepare for a disaster. There are many effective activities that are simple to do and cost little, if any, additional money. PCVs can give these workshops (or, better yet, train their counterparts to give the workshops) to any number of groups such as mothers clubs, fishing cooperatives, village councils, students, etc.

B. Site Selection. Peace Corps Volunteers can provide information about how to select safe sites or how to protect vulnerable sites.

C. Preparedness Planning. PCVs can work with the community to develop a local disaster preparedness plan. Any preparedness activity, no matter how small, can potentially save lives and reduce property damage. A "plan" could be a simple checklist of appropriate actions with the assignment of personnel responsible for carrying out the activities.

D. Agriculture and Food Protection. Peace Corps nutritionists already promoting vegetable gardening can introduce flood resistant crops that are culturally acceptable. Peace Corps agronomists can work with farmers to select flood resistant crops or alternative farming patterns that avoid high risk times when crops are most vulnerable.

E. Food Storage. Appropriate technology PCVs can provide small farmers with technical assistance to build ferrocement or other appropriate strong grain silos to help protect harvests until they are sold.

F. Aforestation. Forestry PCVs can continue to help reduce vulnerability through reforestation efforts which may significantly reduce rapid rain runoff and subsequent flooding. PCVs can also promote the use of fuel-efficient woodstoves. This activity helps to lessen deforestation pressure.

G. Economic Mitigation. Business development specialists can promote the establishment of savings-and-loans programs by cooperatives and other microenterprises to provide a disaster reserve of money.

H. Assistance to Other Agencies. PCVs living in an affected community can assist both local and international aid agencies by monitoring and helping to evaluate long-term reconstruction and recovery programs. Monitoring ensures that they are operating smoothly. Evaluations determine whether or not the program approach is valid and assess the long-term impact on the community. Lessons learned, documented and shared, will help victims of future disasters.

Paper originally published in The Potential Contribution of Peace Corps to Disaster Preparedness in Africa, Briefing papers prepared by INTERTECT for the AID/Peace Corps Disaster Preparedness Conference, Mombasa, Kenya (March 1983).

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DROUGHTS AND DESERTIFICATION

DESCRIPTION OF THE THREAT

A. Definition of a Drought

Drought may be defined as any unusually prolonged dry period. While generally associated with semi-arid or desert climates, droughts can occur in areas that normally enjoy adequate rainfall. Technically, a drought is a condition of climactic dryness that is severe enough to reduce the soil moisture content and water supplies below the minimums necessary for sustaining plant, animal and human life systems. Droughts are usually accompanied by dry, hot winds and may be terminated by violent storms.

B. Causes of Droughts

The basic causes of drought are still not clearly understood by scientists. It is generally believed that droughts are a consequence of changing global weather patterns triggered by ecological events such as solar radiation, excessive build-up of heat on the earth's surface and increased particulate matter such as dust or pollution in the earth's atmosphere. Droughts are accompanied by reduced cloud cover, and thus the land is exposed to increased solar radiation, resulting in increased transpiration and evaporation rates. These conditions add to the potential severity of the drought. When conditions become very dry, available moisture is insufficient to maintain the water table and hence the surface water reserves in streams and in lakes. This situation tends to perpetuate the drought and, once established, the conditions are very difficult to reverse.

Human activities also contribute to the development of drought conditions. Over-grazing, poor cropping methods and improper soil conservation techniques often contribute to creating the drought.

C. Recurrence Interval

Climatologists debate whether drought is a short-term aberration in the climate or the result of long-term climatic changes. Some argue that drought feeds upon itself; that as vegetation is stripped from the land, the surface dries out and reflects more of the sun's heat. This would alter the thermal dynamics of the atmosphere and supress rainfall which would, in turn, dry out more land. Historically, droughts have tended to occur at regular intervals. Many scientists have noted that in areas where long-term droughts have been prevalent, there appear to be surges of dry periods that occur at relatively predictable intervals. With this in mind, climatologists are seeking to

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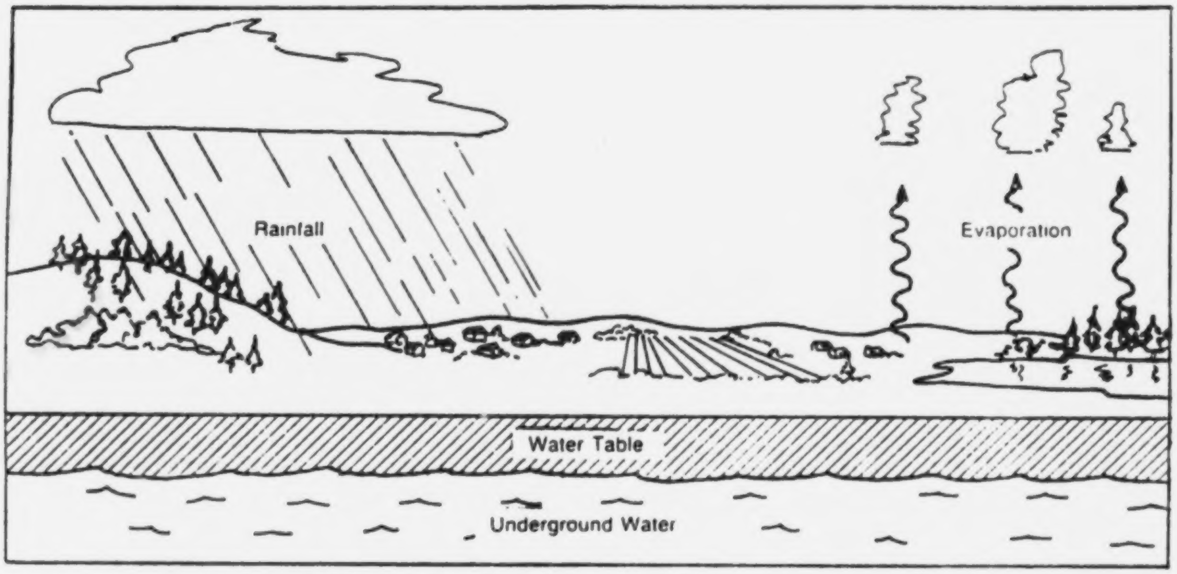
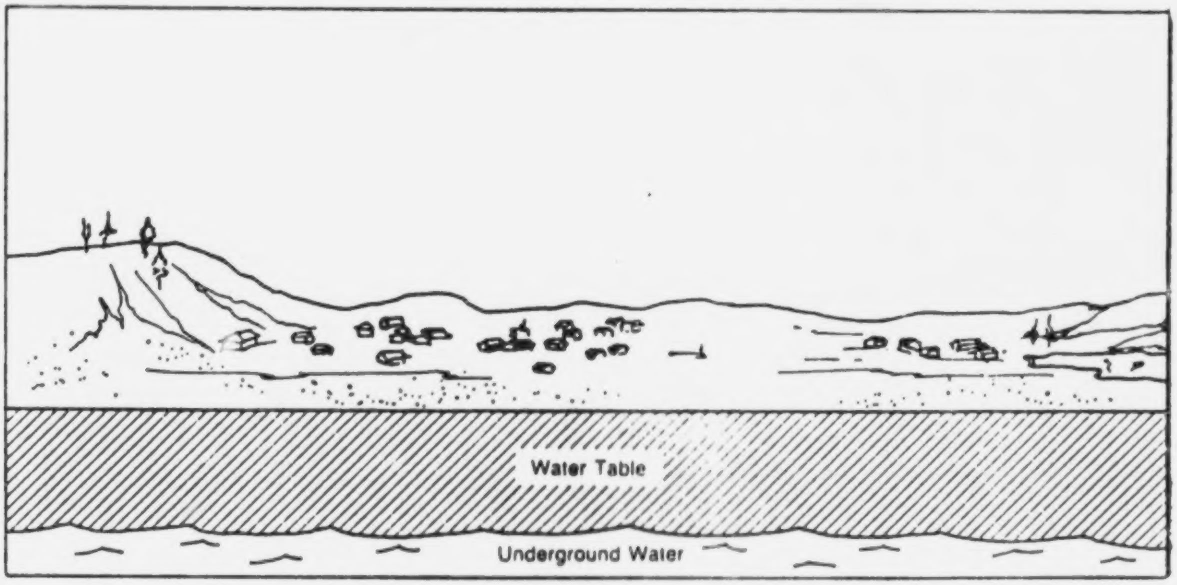
THE DROUGHT CYCLE


Rainfall
Evaporation
Water Table
Underground Water

NORMAL HYDROLOGICAL BALANCE. Water supply is adequate to meet demand. The community grows and land use intensifies.


Water Table
Underground Water

DROUGHT Meteorological changes reduce rainfall, while urbanization, overgrazing, deforestation, and farming reduce water retention of the soil. The normal hydrological balance is broken. The topsoil erodes and the water table is lowered making recovery difficult. Food production and drinking water are reduced and people migrate out of the area.

compile historical records of droughts so that drought forecasting can be made more accurate.

Whether precisely predictable or not, the historical trends can give an indication as to when drought periods might be expected. For this reason, it is important that persons living in marginal or semi-arid areas try to learn about the history of droughts in a particular region and use these as a rule of thumb in predicting when future dry periods might occur.

EFFECTS OF DROUGHTS

The effects of droughts can be divided according to the primary or immediate effects, and the secondary or resulting effects.

A. Primary Effects

Primary effects of drought result from a lack of water. As a dry period progresses and water supplies dwindle, existing water supplies are over-taxed and finally dry up. The primary losses are loss of crops, loss of livestock and other animals, and finally, loss of water for hygienic use and drinking.

B. Secondary Effects of Drought

The secondary effects of drought follow and result from the primary effects. As water supplies dwindle and crops and fodder are depleted, families begin to migrate in search of better grazing lands for their herds or to the cities to seek jobs and alternative sources of income. If the dwindling supplies of food are not replaced, famine can occur, further accelerating the migration out of the stricken areas to less-affected zones. The migration may, in itself, contribute to spreading the scope of the disaster, especially if grazing animals are moved with the people.

If the drought is long-term, it may result in permanent changes in settlement patterns and in social and living patterns. For example, before the 1968 drought, 65% of Mauritania's population were nomads. By 1976 that figure was down to 36%. The town of Nouakchott grew from 12,300 in 1964 to approximately 135,000 ten years later.

Secondary effects of droughts also include major ecological changes. These include increased desertification, increased scrub growth, increased flash flooding and increased wind erosion of soils. Of these, desertification is of the most concern. Technically, desertification occurs when the soil reaches a certain level of dryness. More drastically, desertification occurs when the land takes on the characteristics of a desert. In its most dramatic form, this can mean the encroachment of sand dunes and loss of the majority of vegetation, or replacement of normal vegetation with desert scrub bushes and other plants especially adapted to desert environments. In both cases, the land is rendered useless without large-scale and expensive reclamation measures.

The desertification cycle works as follows. First, a drought kills plants and grasses; animals short on food damage trees and shrubs foraging for food. Humans accelerate the cycle by cutting the trees for firewood. Without trees and grasses for cover, there is nothing to hold the soils. Winds blowing across the surface create dust storms that choke vegetation and cover marginal lands at the edge of the desert with sand. This increases the reflective cover of the ground, speeding evaporation and contributing to more dryness. This increases the drought and enhances the cycle.

Fighting desertification can be both costly and frustrating. Few developing countries have the resources necessary to stop this process once it takes hold, and reclamation successes have been rather limited. The best way to stop desertification is to prevent it from occurring, and the best way to prevent it is through comprehensive mitigation measures involving widespread economic and agricultural development activities.

MYTHS AND LESSONS LEARNED

The most important myth concerning droughts is that nothing can be done to prevent them or to respond effectively once they have started. In fact, small-scale measures can have a significant impact, and with proper forethought the ravaging effects of droughts can often be substantially reduced. The experience of relief agencies in the serious Sahelian drought of the 1970s provided many useful lessons on how to respond to disasters and how not to operate in these conditions. These include:

A. The Importance of Early Warning. Droughts do not occur without warning. There are indicators which can be monitored and interpreted to give adequate notice in order to begin response and reduce the severity of the drought.

B. The Importance of Water Allocation and Rationing. At the beginning of a drought it is important that water supplies be used wisely. Priorities should be established and measures to protect water supplies should be taken immediately. In some cases, researchers have noted that if water supplies had been rationed and allocated so that the high priority areas received sufficient water, the effects of the droughts would have been minimal, and shortages could have been met through supplies from outside the affected area.

C. The Importance of Responding to the Disaster Where It is Occurring. If early warning signs are not recognized and a drought reaches advanced stages, migrations of people and animals normally occur. In the past there was a tendency to supply relief to the drought victims at the point where they migrated to, not where they migrated from. This served to draw more people out of the affected areas and increase the problem. The lesson was that relief supplies should be provided at the point where the drought is occurring. This would enable people to stay in the area and thus provide a work force to respond to the drought.

D. The Importance of Encouraging an Early Return of Migrants. Relief operations for persons displaced by droughts should be of limited duration and should attempt to encourage the return of these people to their homes as soon as possible. Experience has shown that if they do not return within several months, it is unlikely that they will ever return.

E. The Need to Focus on Agriculture, Animals and Water Supply. In past operations there has been an overemphasis on relief. Relief operations must be balanced by immediate and widespread attacks on the causes of the drought and measures to reduce the impact. Emphasis must be placed on improving agriculture, saving herds, and improving and expanding water resources.

F. The Need to Avoid Camps. For most relief agencies, the easiest way to distribute a variety of aid is by centralizing the distribution and establishing a refugee camp. Too often, however, these camps become permanent settlements. As the primary goal is to encourage people to return, relief efforts should be focused on providing the relief to the people in their own communties. This means that a great deal of sophistication is required in the relief logistics system.

THE IMPACT OF DROUGHTS ON DEVELOPMENT

If a drought is allowed to continue without response, the impact on development can be severe. Food shortages may become chronic, and the country must spend more of its scarce resources on importing food. Uncontrolled urban growth may be accelerated. To respond to this, the government must borrow heavily and must divert money from other development schemes into meeting these needs. All serve to undermine the potential for economic development.

If drought response is treated as only a relief operation, it may wipe out years of development work, especially in rural areas. Agricultural projects in particular are most likely to be affected by droughts. For those in agricultural development, droughts or the threat of droughts should be considered a part of the overall development equation. A balanced agricultural program that develops good water resources, addresses the problems of soil erosion and adopts realistic limits on the expansion of animal herds, or which accompanies the expansion of herds with comprehensive range management, will contribute to the mitigation of drought impact.

The same philosophy is used for reconstruction in the aftermath of a drought. Reconstruction should be viewed as an opportunity to accelerate development work. It is an ideal time to introduce improved animal husbandry techniques, rangeland management, water resource development schemes and erosion control measures.

PRE-DISASTER PLANNING

To reduce the threat of droughts and to lessen their impact should they occur, a number of measures can be taken. Some of the more typical activities are:

A. Mitigation

The first step in disaster mitigation is to identify areas that are at risk to a drought. In recent years, a large number of studies have been carried out that identify drought-prone areas. Peace Corps staff should be cognizant of these zones.

To establish whether an area is drought-prone, historical records can be analyzed to determine whether or not droughts have occurred previously. For extremely remote areas where no information exists locally, the AID Office of U.S. Foreign Disaster Assistance can be queried to obtain satellite data which can provide an indicator of whether or not the area is vulnerable.

Once vulnerable areas have been identified, priority zones should be established. These zones are normally the most marginal settlements that are most at risk from a drought. Once the priority zones have been identified, comprehensive and integrated rural development programs should be initiated. Among the usual activities are:

1. Agricultural improvements including modifying cropping patterns and introduction of drought-resistant varieties of crops;

2. Rangeland management including improvement of grazing lands, improved grazing patterns, introduction of feed lots and protection of shrubs and trees;

3. Water resource development including improved irrigation, development of improved storage facilities, protection of surface water from evaporation and introduction of drip irrigation systems;

4. Animal husbandry activities.

B. Preparedness Activities

1. Establish a Monitoring System. The first step in drought preparedness is to establish a monitoring system to provide warning if a drought is imminent. A monitoring system should be based on simple information that non-technical observers can acquire and transmit easily. Such a system is usually based on indicators. Among the normal indicators of the onset of a drought are:

    a. An unusual dry period;

    b. An increased number of wind storms;

    c. An increased number of dust storms;

    d. Diminishing water supplies;

    e. An increase in the death rate of animals;

    f. Changes in the migratory patterns of nomads;

    g. Changes in vegetation, especially the introduction of desert plants such as scrub brushes;

    h. Unusual, that is, unseasonal, changes in the prevalence rates of specific communicable diseases associated with personal and environmental hygiene, principally non-venereal skin diseases and diarrheal diseases, indicating the diminished use of water for washing.

2. Identify and Stockpile Seeds for Alternative Drought-Resistant Crops. Once a drought begins, it is important that some attempt be made to stimulate alternative agricultural activities. A number of crops have been developed that can survive mild droughts. Seeds should be kept on hand so that farmers will not lose everything in a drought.

3. Identify and Stockpile Feeds for Cattle or Other Livestock. Once a drought begins, it is important that the needs of cattle and livestock be recognized. Losses can be greatly reduced if herds are penned up and fed in feedlots. This will not only save the animals but will take pressure off of the land and let vegetation regenerate.

4. Determine Human Nutritional Requirements and Develop an On-Site Relief Distribution Plan. As a drought develops, it is important that people receive relief supplies as near to their homes as is possible. While this puts a great burden on the relief agency, it will ensure that people do not leave their homes and migrate to other areas. If they leave, the relief period will be prolonged and there will be fewer people in the area to take action to reduce the impact of the drought.

5. Identify and Select Appropriate Action to Fight Desertification. If desertification is a potential threat, measures should be taken to identify suitable approaches that could be employed to prevent the spread of deserts during a drought period. Plans should be developed to implement programs to prevent further encroachment of deserts, and the necessary equipment and material should be acquired and strategically placed.

EMERGENCY RESPONSE

Once a drought has commenced, it is important that the emergency response be swift and comprehensive. If action is taken quickly, the following activities normally take place in the affected area:

A. Distribution of supplementary food for vulnerable population groups in the affected zones.

B. Distribution of fodder for animals in the affected zones.

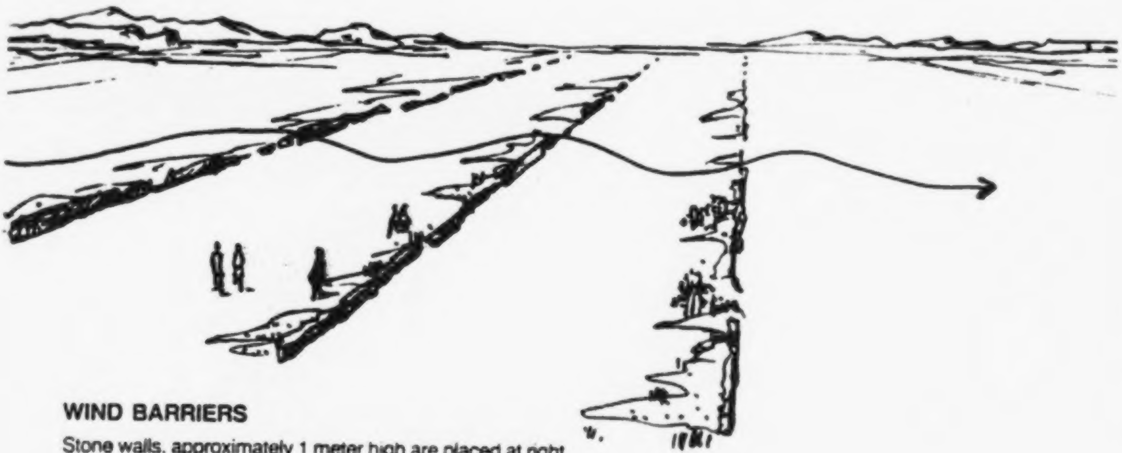
C. Provision of water supplies to the communities (water supplies must be constant and people must be sure of this constant supply, otherwise they will leave the area).

D. Distribution of seeds for alternative crops.

If desertification is accelerated during a drought, the following activities are normally taken to reclaim the land and develop water resources:

A. Construction of sand fences.

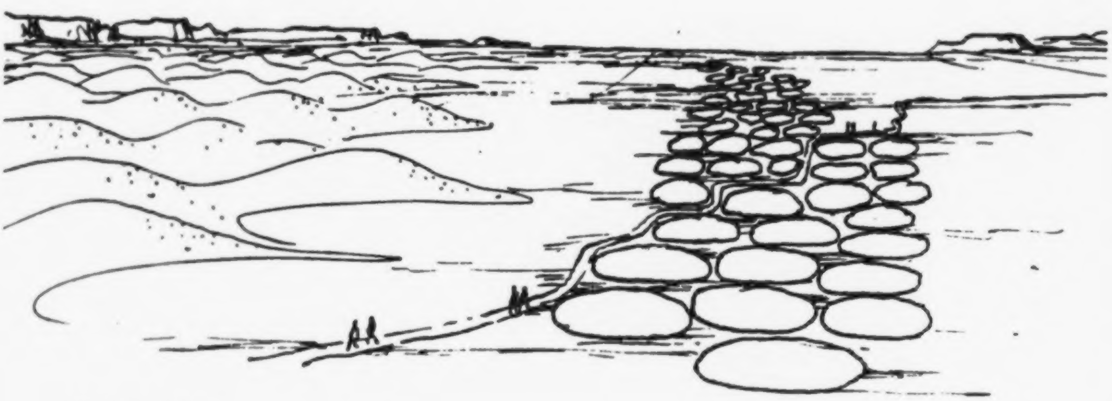
B. Construction of wind barriers. Wind barriers are small walls no more than a meter high which are placed at right angles to the prevailing wind. As winds blow across these barriers, they deposit moisture which soaks into the ground and small green patches begin to take root. Eventually these may grow to be quite large and often can help replenish ground water as well as providing some small green space for protection against desert encroachment (see next page).



WIND BARRIERS

Stone walls, approximately 1 meter high are placed at right angles to the wind. Wind loses its moisture as it is deflected over the barriers. The moisture soaks into the ground, spreading green growth. Soil stabilizes and more water is trapped.

COUNTER-DESERTIFICATION MEASURES



GREEN BASINS

Small, circular banks are plowed in fields. Wind-blown seeds are trapped and nourished by water trapped in each circle. Green growth occurs along embankments, eventually spreads to cover entire circle.

C. Establishment of Green Basins. In a technique developed in Australia, green belts are created by building or plowing small circular banks in a field to form a series of basins. These trap wind-blown seeds and nourish them by trapping moisture and water to form small temporary ponds. The embankments protect the seeds from dust storms, and the moisture provides the nourishment to enable them to sprout. Green belts several miles wide and hundreds of miles long are often built as a line-of-defense much like a fire break to prevent further encroachment of the desert (see next page).

D. Tree Planting. One way to fight the encroachment of deserts is to plant trees and shrubs as a barrier. Each tree encourages the growth of a related ecosystem and provides a small deterrent to wind-driven dust and sand.

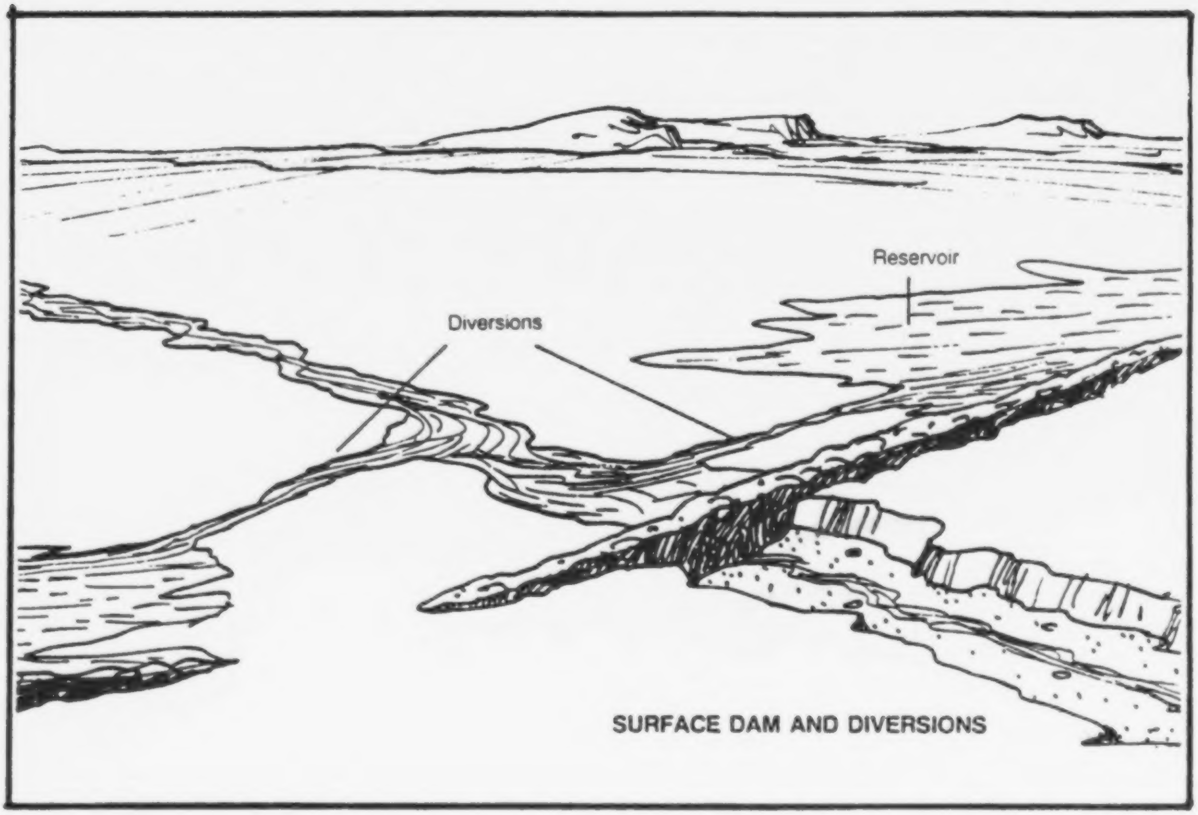
E. Retention Dams. Small storm retention dams can be built across arroyos or wadis to trap water from occasional flash floods. Some of the water can be diverted into nearby depressions to form temporary reservoirs. These provide temporary water for drinking and irrigation, and can seep into the soil to replenish soil moisture and ground water (see following page).

F. Sub-surface Dams. Sub-surface dams are used to trap water in the sandy riverbeds of a dry wadi. A trench is dug across the streambed down to a layer of impervious clay. The trench is then filled and packed with clay to form an underground dam. When flash floods occur, a portion of the water will be trapped in the sand behind the dam. Small wells can be dug by hand to reach the water (see following page).

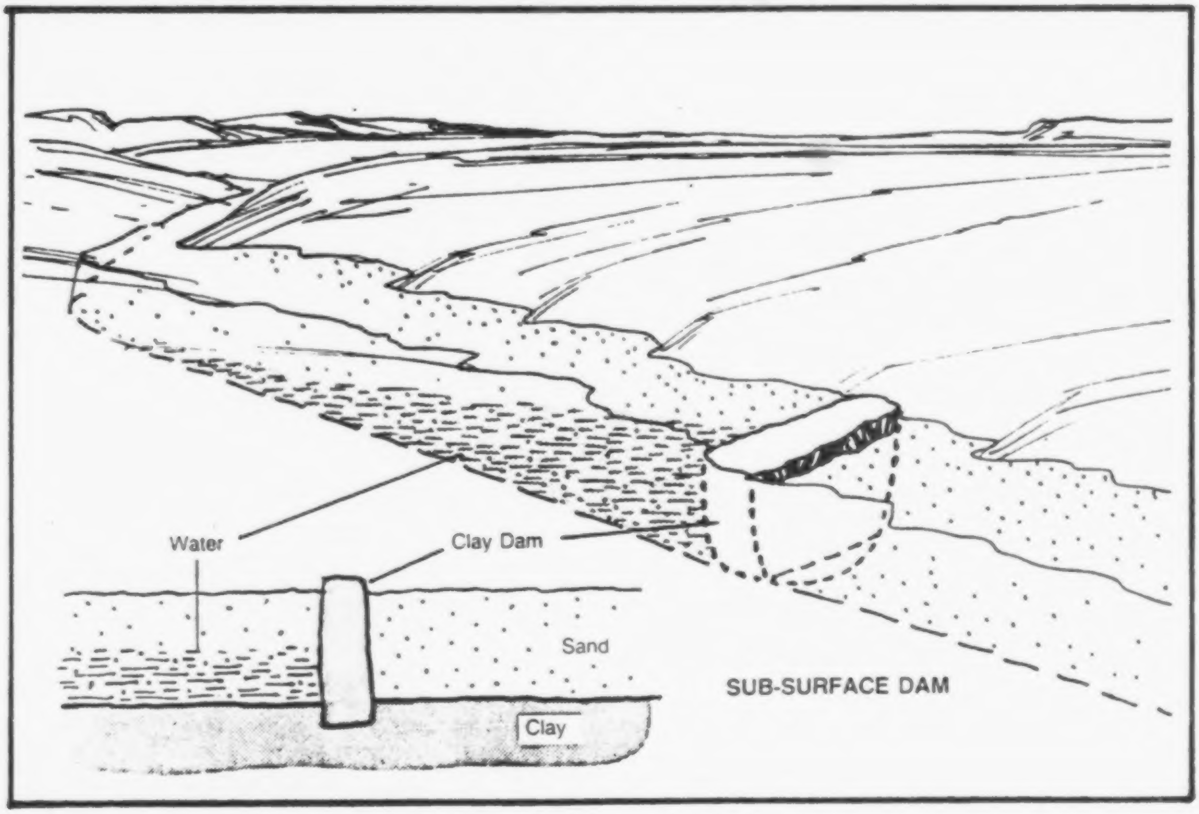
If emergency measures are not instituted immediately at the beginning of a drought, it is inevitable that large populations will begin migrating from the drought-stricken area. Once this has happened, the emergency response becomes a famine response, and emergency relief measures must be initiated.

POST-DISASTER ACTIVITIES

Once the drought has abated or the flow of displaced persons has been stemmed, permanent recovery activities are initiated. Usually the victims and the government must decide on one of two courses of action: re-establishment of communities in the drought-stricken area, or resettlement of the drought victims to other unaffected areas. As a general rule, resettlement is not favored except in extreme circumstances or where desertification has made return to the original communities impossible.


Reservoir
Diversions
SURFACE DAM AND DIVERSIONS

WATER RESOURCE DEVELOPMENT


Water
Clay Dam
Sand
Clay
SUB-SURFACE DAM

If the drought victims return to their homes, the focus is on re-establishing, and hopefully improving, normal economic and agricultural activities. Typical programs include:

--- economic assistance;

--- agricultural extension;

--- animal husbandry;

--- rangeland management;

--- water resource development;

--- agricultural engineering works including development of windbreaks, crop protection devices, installation of improved irrigation systems and introduction of drip irrigation.

The reader should note that the reconstruction activities are virtually identical to the disaster mitigation activities and require the same types of skills and technical inputs.

APPROPRIATE ROLES FOR PEACE CORPS VOLUNTEERS

Peace Corps Volunteers may be called upon to play a number of very important roles in all phases of a drought. Among these are:

A. Establishing and participating in warning systems. PCVs with the following backgrounds could be involved: agronomists, animal husbandry specialists, agricultural engineers, soils specialists and public health personnel.

B. General development support during disaster mitigation and reconstruction phases. PCVs with the following qualifications might be called upon to participate: agronomists, animal husbandry specialists, agricultural engineers, soils specialists and public health personnel.

C. Emergency Relief. During the emergency phase, the following job skills could be employed:

    1. Nutritionists (to operate selective feeding programs);

    2. Agricultural specialists (to help refugees to establish small subsistence gardens in their communities or refugee camps and to introduce drought-resistant varieties during the emergency);

    3. Physicians and nurses (to operate intensive feeding programs for severely malnourished drought victims);

4. Animal husbandry specialists (to establish and manage the feed lots for livestock in the drought-affected zones);
5. Social workers (to work with drought victims and provide a variety of social and counselling services);
6. Handicraft specialists (to develop handicrafts as a source of alternate income during the drought);
7. Water engineers (to help develop water resources in the drought-affected areas, to establish better irrigation and storage facilities, and to develop water supplies for settlements of displaced victims);
8. Sanitary engineers (to build and maintain sanitation systems in new settlements and refugee camps);
9. Architects (to design and build refugee camps should they be required, and to provide shelter in new settlements).

Edited paper originally published in The Potential Contribution of Peace Corps to Disaster Preparedness in Africa, Briefing papers prepared by INTERTECT for the AID/Peace Corps Disaster Preparedness Conference, Mombasa, Kenya (March 1983).

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DISASTER INFORMATION RESOURCE ORGANIZATIONS

Australian Overseas Disaster Response Organisation (AODRO)
65 Campbell Street
Surry Hills, N.S.W. 2010
(P.O. Box K425, Haymarket, N.S.W. 2000)
Australia

Centre for Information & Research on Disasters and Natural Hazards (CIRDNH)
Caulfield Institute of Technology
P.O. Box 197
Caulfield East
Melbourne, Victoria 3145
Australia

Centre for Overseas Pest Research
Overseas Development Administration
Eland House, Stag Place
London SW1E 5DH, U.K.

Centre de Recherche sur l'Epidemiologie des Desastres
Ecole de Sante Publique
Unite d'Epidemiologie
Universite Catholique de Louvain
Clos Chapelle-aux-Champs, 30
B-1200 Brussels, Belgium

Ian Davis
Disasters and Human Settlements Unit
Department of Architecture
Oxford Polytechnic
Headington Oxford OX3 OBP, U.K.

Desert Locust Control Organization for Eastern Africa
Addis Ababa, Ethiopia

Department of Civil & Systems Engineering (Wind Research)
James Cook University of North Queensland
Townsville, Queensland
Australia

Disaster Research Center
Ohio State University
154 N. Oval Mall
Columbus, Ohio 43210, USA

Institute for Food and Development Policy
2588 Mission Street
San Francisco, California 94110, USA

International Disaster Institute (IDI)
85 Marylebone High Street
London W1M 3DE, U.K.

International Reference Centre for Community Water Supply & Sanitation
P.O. Box 5500
2280 HM Rijswijk, The Netherlands

International Society on Disaster Medicine
10-12 Chemin de Surville
1213 Petit-Lancy
Geneva, Switzerland

INTERTECT
P.O. Box 10502
Dallas, Texas 75207, USA

League of Red Cross Societies
17, chemin de Crêts, Petit-Saconnex
P.O. Box 276
1211 Geneva 19, Switzerland

National Council for International Health
2121 Virginia Avenue, N.W., Suite 303
Washington, D.C. 20037, USA

Natural Disaster Recovery & Mitigation Resource Referral Service
The Academy for Contemporary Problems
400 North Capitol Street, N.W., Suite 390
Washington, D.C. 20001, USA

Natural Hazards Research & Applications Information Center (NHRAIC)
Institute of Behavioral Science #6
University of Colorado
Boulder, Colorado 80309, USA

Nutrition Planning Information Service
Community Systems Foundation
1130 Hill Street
Ann Arbor, Michigan 48104, USA

Office of U.S. Foreign Disaster Assistance (OFDA)
Agency for International Development
Washington, D.C. 20523, USA

Pan American Health Organization
Emergency Preparedness & Disaster Relief Coordination Unit
525 Twenty-Third Street, N.W.
Washington, D.C. 20037, USA

Sahel Documentation Center
Michigan State University Libraries
East Lansing, Michigan 48824, USA

United Nations Development Programme (UNDP)
One U.N. Plaza
New York, New York 10017, USA

United Nations Disaster Relief Office (UNDRO)
Palais des Nations
CH-1211 Geneva 10, Switzerland

United Nations High Commissioner for Refugees (UNHCR)
Palais des Nations
CH-1211 Geneva 10, Switzerland

USAID Missions in country

VITA (Volunteers in Technical Assistance) Inc.
1815 N. Lynn Street, Suite 200
Box 12438
Arlington, Virginia 22209, USA

PERIODICALS RELATING TO NATURAL DISASTERS

Disaster Management
Joint Assistance Centre
H-65 South Extension-1
New Delhi 110049, India

New periodical to serve voluntary agencies in India. Often has short articles concerning management of natural disasters, case studies, etc.

Disaster Preparedness in the Americas
Pan American Health Organization
Emergency Preparedness & Relief Coordination Unit
525 Twenty-Third Street, N.W.
Washington, D.C. 20037

Newsletter giving information on PAHO, WHO, U.N. and other agencies. Reviews current literature and reports on member country projects, as well as including short articles on disaster-related topics. Excellent resource.

Disasters: The International Journal of Disaster Studies and Practice
International Disaster Institute
85 Marylebone High Street
London W1M 3DE, U.K.

Quarterly devoted to articles and information concerning all facets of relief (pre-disaster planning and mitigation, case studies, epidemiology, etc.). Excellent resource for publications, contacts and evaluations.

Habitat News
U.N. Centre for Human Settlements
Kenyatta Conference Centre, Room 1911
P.O. Box 30030
Nairobi, Kenya

Official newsletter of the UNCHS reporting on programs and activities of the U.N., governments and non-governmental organizations in the field of human settlements. Includes list of upcoming conferences/meetings, publications related to human settlements, project reports, articles on housing and planning issues, etc.

ICVA News
International Council of Voluntary Agencies
13 rue Gautier
1201 Geneva, Switzerland

Periodical giving information on programs, policies, publications, etc., of interest to agencies and individuals in the fields of development, refugee assistance, disaster relief and preparedness. Excellent resource for volag information, both organizational and operational. Includes international employment registry, personnel and address changes, list of upcoming conferences/meetings, etc.

Mass Emergencies and Disasters
International Library
P.O. Box 1893
S-75101 Uppsala, Sweden

New periodical basically focusing on the social and behavioral aspects of mass emergencies/disasters. Includes listing and reviews of literature and visual materials, research articles, and sections for issue and opinion feedback.

Natural Hazards Observer
Natural Hazards Research Applications & Information Center (NHRAIC)
IBS #6
University of Colorado
Boulder, Colorado 80309

Provides information on conferences and meetings; federal and state policies, regulations and upcoming legislation; organizations and their projects; grants for research in the natural hazards field; recent publications. Primarily aimed at researchers, but contains excellent information on available studies and contacts.

Refugee Reports
American Council for Nationalities Service
1424 Sixteenth Street, N.W., Suite 404
Washington, D.C. 20036

Up-to-date articles about refugees and resettlement. Includes information on conferences and work of other organizations.

Refugees
U.N. High Commissioner for Refugees
Palais des Nations
CH-1211 Geneva 10, Switzerland

Monthly newspaper focusing on refugee situations throughout the world. A new special supplement, Refugees Magazine, is published periodically to deal with various issues and themes in a more comprehensive manner. Reviews of refugee-related publications, interviews, articles on special topics, etc., are included.

SAHEL
Sahel Documentation Center
Michigan State University Libraries
East Lansing, Michigan 48824

Collection of bibliographic material and information concerning countries in the Sahel region of Africa. Extensive references on drought.

UNDRO News
Office of the U.N. Disaster Relief Coordinator
Palais des Nations
1211 Geneva 10, Switzerland

Reviews recent disaster situations throughout the world and the response by U.N. agencies and other organizations as well as the governments involved. Good resource for meetings and conferences organized by the U.N., non-governmental and intergovernmental organizations, voluntary agencies and others. Also good resource for recent publications, articles, etc., on natural disasters and related subjects.

Unscheduled Events
c/o Jan Trost
Uppsala University
P.O. Box 513
S-751 20 Uppsala, Sweden

New periodical published by the Research Committee on Disasters (who also publish a new journal, Mass Emergencies and Disasters). Will contain articles on research projects, lists of recent publications, and reports on activities, conferences, etc. Will emphasize social aspects of disasters.

Peace Corps Volunteer and Trainee
Disaster Preparedness Manual

Source: Information Collection and Exchange Resource Packet No. 3

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Country Evacuation Plan

I. Introduction

The purpose of this manual is to describe to Peace Corps Volunteers and Trainees the actions to be taken if a disaster, natural or man-made, strikes the country or region of a country. It also informs you about (1) general relief operations which will take place, and (2) the types of activities in which you might become involved. While the degree of vulnerability of a given country or region of a country to a disaster may vary, it is most important that PCVs and PCTs be aware of information, organizational operations, and programming procedures which will be followed in order to account for their safety and well-being, and, if requested, aid the PCVs, PCTs, and the Host Country in relief operations.

This manual is divided into 4 parts.

1. Disaster Preparedness Procedures gives background information concerning on-going disaster relief planning activities, describes resources available in disaster situations, and most importantly, details precautionary measures to be taken and procedures for reporting personal status.
2. Immediate Response to a Disaster Situation describes the immediate steps to be taken if a disaster strikes.
3. Disaster Assistance Phases and Operations describes general disaster relief programs and activities in which PCVs and PCTs may be asked to participate.
4. Technical Support cites specific documentation and resources which will aid PCVs and PCTs in carrying out disaster-related activities.

Your thorough familiarity with the information and procedures described in the manual will reduce the peril to you in your site, enhance communication, and support your efforts to carry out necessary actions.

II. Disaster Preparedness Procedures

A. General Statement

There is always the possibility that while you are a PCV or PCT a national or local disaster, whether natural (such as a flood, drought, fire, hurricane, earthquake, volcanic eruption, or epidemic) or human instigated (such as a riot, violence, civil strife, explosion, fire, or epidemic) may occur.

In order to be prepared to account for and assist Volunteers and Trainees, and to mobilize those who can lend aid in such a situation, whether of national or local scope, the Peace Corps Staff and Volunteers have developed a Disaster Preparedness Manual based on national and international experience in such situations. Its effectiveness will depend to a great extent on Volunteers' and Trainees' knowledge and familiarity with the plan. Please read it carefully so that when an emergency arises, you will know how to react.

B. Reporting and Communications

1. Personal Status Reporting Procedures

In an emergency situation, the first concern of the Peace Corps is to verify the safety of all Volunteers and Trainees as quickly as possible. Often when a national (or local) emergency occurs, the national and international news services are quick to report it, frequently with considerable exaggeration. Too often details of the emergency become distorted. Therefore, undue delay in reporting your personal status and whereabouts can cause unnecessary concern.

Past experience demonstrates that when these events are reported in countries where Peace Corps is present, relatives and friends immediately call the Peace Corps office in Washington for news of Volunteers and Trainees. Knowing the concern of these people, Peace Corps tries to calm their concerns by informing them as soon and as accurately as possible about the safety of Volunteers and Trainees. If delays in verifying the status of Volunteers and Trainees occur, it may be reported (as has happened in the past via U.S. news services) that not all Volunteers and Trainees have been accounted for, thus causing unnecessary and probably unwarranted worry. It is extremely important that you report your status and whereabouts to your Program Manager or Country Director as soon as you possibly can.

Reporting Procedures

a. If an emergency, local or national, occurs, stay in your site and immediately notify your Program Manager or the Peace Corps Country Director of your status and whereabouts.

If in an unaffected area, report to your Program Manager or staff coordinator and get his/her approval before going into the disaster area. If you go to the area you may be endangering yourself, putting a strain on short supplies of food and water, and adding to the traffic congestion on roads and highways. Without proper instructions, information, identification, equipment and supplies, you could become another victim at a site needing assistance. Peace Corps is prepared to assist in emergency situations, but that assistance will always be coordinated through Host Country emergency efforts. If an emergency occurs in your own area, you may get involved in the relief effort. If so, first report to the Peace Corps, then link up with a Host Country agency or institution.

In reporting your personal situation, be sure to include the following information:

1. Name,
2. Location,
3. Date and time of communication,
4. State of health and extent of injury or illness, if any, and
5. Address and means by which communications can be maintained with you.

Be sure to spell your name correctly to the operator if you do not have direct access to the communication media so that it can be communicated accurately.

It is extremely important that all Volunteers and Trainees communicate this information, whether the emergency is local or national for the following reasons:

1. A PCV/PCT may be out of his/her assigned site and in the emergency area without the knowledge of the Peace Corps Staff, or may be thought to be in the disaster area.

2. Parents, friends, and reporters in the U.S. usually do not have a good understanding of where Volunteers' and Trainees' sites are located within the country and many times assume that PCVs and PCTs are in the affected areas when they are not. They will want accurate information about your safety.
3. The Peace Corps Country Staff is required in the case of an emergency to verify the safety of all Volunteers and Trainees through a visual sighting, and report the same to Washington so that inquiries from those concerned about you can be answered with accurate, current information.
4. If you need assistance, only prompt, accurate reporting of your status can insure that aid will be gotten to you as soon as possible.

b. If you are not at your site, report your status immediately following the preceeding instructions in (a). You should also indicate specific travel plans if you are returning to your site or going to another location. Be sure to give the name and address with whom Peace Corps can communicate in order to verify the execution of your travel plans.

c. If it is necessary for you to leave your site, you must indicate the name and address of at least one person in the site who knows of your specific travel plans, destination, length of stay, and date of return.

d. If for some reason you cannot personally report on your status, you should have your Peace Corps buddy (another PCV or PCT who has assumed responsibility for knowing your whereabouts at all times) to report for you by the most reliable means available (see below). You will be asked to complete a Revised Volunteer Record Sheet (see appendix, page A01) on which you will supply information necessary for emergency situations, including the name and means of contacting your buddy.

If you or your buddy cannot report your status, have your supervisor or other responsible person (preferably two) report for you using the most reliable means available.

e. If evacuation from your site is necessary, cooperate with local authorities who are in charge. Always try to inform the Peace Corps Staff of your whereabouts. Listen to the national emergency ratio system or public radio broadcasts as it is one way the Peace Corps may contact you.

f. In case of a national emergency, the Peace Corps office and the U.S. Embassy will receive calls 24 hours a day during the critical period. The U.S. Embassy always has a duty officer ready to receive incoming calls, even under normal circumstances. Urgent messages left with the Embassy during non-office hours will be immediately relayed to the Peace Corps Duty Officer.

Confirmation of your safety and whereabouts, once reported by you, will be immediately relayed to Peace Corps/Washington, Office of Special Services (OSS). When a major disaster strikes, OSS immediately contacts persons you indicated should be called in case of emergency; OSS assures them that they will be notified of your status as soon as it is confirmed. You should remind your family that they may contact the Office of Special Services by calling 800-424-8580, Ext. 85 or 86 during normal working hours and 202-638-2574 at all other times.

Once OSS confirms your safety and whereabouts, it is your responsibility to initiate further contact with concerned persons. Please ask them not to attempt to contact you directly by phone or cable as means of communication may be damaged and/or heavily overloaded. Remember, initiating further contact is your responsibility.

2. Means of Communications

In immediately reporting your safety and whereabouts to the Peace Corps Staff, consider how you will communicate that information. Remember, speed and accuracy in reporting are critical. Most often in an emergency situation, normal communication lines (roads, telegraph, telephone) are damaged, destroyed, or if in operation, terribly overburdened. Telegraph communications often become lost or garbled beyond recognition. Do not depend on a telegram as a reliable means of reporting to Peace Corps. One of the best alternative means of reporting is by two-way radio.

You will find in the Appendix to this handbook a series of information sheets which identify communication, personnel, and equipment resources. These sheets include:

Communication Information — Page

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    B. Bus and Railroad Companies by Site and Company A03
    C. Airstrips by Site and Characteristics A04
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4. General Emergency Telephone Numbers A07
5. Car Rentals A07
6. Plane Rentals A07
7. National Radio Stations A08

Familiarize yourself with the information and make specific note of the resources in or near your site which can be used in case of an emergency. If possible, become acquainted with the operations and personnel of these resources.

Speed and accuracy are most important in communicating the needed information and the most reliable means should always be sought.

The means by which you can report your status are listed in priority ranking from most to least reliable. Always attempt to use the most reliable (i.e. highest priority) means available.

1. Direct sighting and reporting by you to a Peace Corps Staff member.
2. Direct voice communication by you to a Peace Corps Staff member (via telephone or radio).
3. Direct sighting and reporting to your Peace Corps buddy with that information relayed personally by him/her or through direct voice communication (via telephone or radio) to a Staff member.
4. Direct written communication by you or by your buddy after a direct sighting and reporting by you to him/her (via a hand-carried message---telegraph or mail service is often disrupted or overloaded during an emergency and probably cannot be relied upon).
5. Direct sighting within 24 hours by at least two different individuals who relay the information by direct personal or voice contact with Peace Corps or by hand-carried message.

Unless you can personally report your status by face-to-face communication with a Staff member or by voice communication, you should use a combination of the remaining alternatives to decrease the possibility of reporting delay or error. If these remaining alternatives are used, you should send daily messages, if possible, until you receive acknowledgement of your message and instructions from the Peace Corps Staff. Remember, Peace Corps will report you unaccounted for, if necessary, rather than report your safety and whereabouts according to an unreliable message.

3. Personal Documents

In case of an emergency you should carry with you all personal documentation (passport, WHO card, Peace Corps identification card, host government identification carnet, driver's license, etc.) which you have in your possession in order to facilitate identification and travel. The Peace Corps Staff will explain document control procedures and their use in an emergency situation if you do not have all your personal documents with you at all times.

Please cooperate with the Peace Corps Staff in document control and make sure your documents are kept up to date. In case of emergency, innoculation or re-innoculation or other actions involving documents may be necessary. Your full cooperation will make the task less difficult and will be greatly appreciated.

4. Disaster Information Reporting

Given the sensitivity to national security and information gathering issues, you should refrain from reporting on conditions in your site unless you are specifically requested to do so by your supervisor or other proper local country authorities, or by the Peace Corps upon request by the Host Country government. In instances where assistance is requested, and accurate and reliable information is available, the following will be of particular use in disaster relief operations:

1. Condition of key public services (potable water and sewerage systems; hospitals, schools, and other public buildings; roads, bridges, airstrips, and other means of communications; etc.);
2. Type and extent of damage to structures;
3. Characteristics and extent of injuries, illnesses and deaths;
4. Type and extent of relief activities underway (medical attention, potable water and food distribution, provisional shelter, removal of debris and rubble, reestablishment of communications, etc.);

5. Need for assistance by type and quantity (medicine and medical personnel, food and water, clothing, shelter, communications equipment, earthmoving equipment, etc.);
6. Weather conditions; and
7. Type and number of personnel from various agencies involved in disaster relief operations.

Be as concise, descriptive, and brief as possible. While it will be difficult to quantify damage and needs, try not to exaggerate or over-estimate. In the short term, relief materials and personnel are often in short supply and unwarranted application of rerources to one area may mean shortages or non-availability of those resources in another area needing assistance.

5. Dealing with the News Media and Information Inquiries

During the highly emotional period of an emergency and immediately afterwards, you should not make comments to those outside Peace Corps concerning either the safety of Volunteers and Trainees, the extent and type of damage, or the relief efforts underway by the Host Country government and national and international assistance organizations. All inquiries for this type of information should be directed to the Peace Corps Country Director or the U.S. Ambassador. Peace Corps will prepare daily reports on PCV and PCT safety and make these available to concerned parties.

Experience has taught that even "off the cuff" or "personal observations" made to national or foreign press people, inquisitive individuals, or Host Country nationals often (and quickly) become "official" sources and comments stating the Peace Corps' or the U.S.'s position on disaster-related issues and situations. Many individuals, agencies, and institutions, both national and international, may become involved in disaster relief activities and there is a considerable amount of rivalry between them for publicity and exposure in order to enhance their image and/or fund raising capacities. Reporting of disaster relief efforts often dwells on this rivalry as well as the strengths and weaknesses of different assistance programs, including those of the Host Country government. Statements made concerning these programs are often very general in nature or based on incomplete or inaccurate information. Even if correct, these statements are often mis-reported or used in partisan, sometimes damaging ways.

Again, no comments should be made to anyone outside of Peace Corps concerning the disaster situation, nor on relief efforts or their effectiveness. Inquiries for such information should be directed to the Peace Corps Country Director.

6. General Evacuation of Peace Corps Personnel

If it ever becomes necessary to evacuate all Peace Corps personnel from the host country, the U.S. Ambassador or his designate will make the decision after discussion with the Peace Corps Country Director. If this should happen, the Country Director will give instructions (usually via national radio) and outline evacuation procedures to be followed. These instructions will include information on where and when to assemble for the evacuation, which will most likely be done by air transport or train if available.

Unless such an announcement is made, you should follow the predetermined Country Evacuation Plan, a copy of which is included in this manual. Remember, during an evacuation, it is most important that you communicate your personal status, proceed to a safe area as soon as possible, and follow the instructions in the predetermined Evacuation Plan, unless instructed to do otherwise.

C. Volunteer and Trainee Skill Resources

In time of an emergency, certain skills are needed to assist in relief efforts, to perform life support functions and to begin rehabilitation programs. The skill areas most generally requested for such activities are (in order of urgency of service):

1. Medical Personnel---doctors, nurses, para-medics, persons trained to administer first aid and innoculations (typhoid, smallpox, etc.).
2. Heavy Equipment Operators---drivers and mechanics for bulldozers, front graders, road graders, back hoes, trailer trucks, heavy trucks, fork lifts, etc.
3. Architects, Engineers, and Construction Specialists---to restore communications, roads, bridges, potable water and sewerage systems, and electrical power; to construct temporary and provisional shelters for public facilities and housing (carpenters, electricians, plumbers, masons), and to evaluate damaged structures and make recommendations concerning demolition, repair, or reconstruction.
4. Administrators and Managers---to set up administrative procedures for distributing relief, supplies, train and manage personnel, maintain inventories, evaluate need and effectiveness of programs, etc.
5. Other Skills---particularly those in communication (translators and radio operators), transportation (pilots), and mechanical areas.

In order to be able to best utilize the services of Volunteers and Trainees during or following an emergency, as much information as possible must be on record so that Peace Corps can quickly identify personnel resources. You should fill out a Volunteer and Trainee Skill Resource Sheet (see appendix, page A09). Please be as accurate and specific as possible; if the information about your abilities is misleading you may actually hamper relief efforts. Please do not exaggerate your abilities or experience. For example, driving a tractor is not the same as operating a bulldozer, and driving a pick-up truck is not the same as driving a tractor trailer.

Volunteers and Trainees want to help out after an emergency. There is probably something important that you can do. Your skill might be in comforting people; preparing food, or taking phone calls, as well as those activities mentioned earlier. If you are willing to help, you can probably be utilized.

This information will be kept on file by skill type, program, and geographic area of the country in order to quickly identify the most appropriate, available resource (see appendix, page A10). At your request, upon completion of your Peace Corps service your sheet will be transferred to a reserve file for a one year period, thus indicating that you would be interested in re-entering Peace Corps on a short term basis to assist as needed in an emergency situation. This type of assistance has become common over the years and Returned Volunteers have rendered substantial aid and assistance.

D. Disaster Causation, Prediction and Hazard Location

It is important that you become aware of the probability of a given type of disaster in or near your site. If there is a relatively high probability of a particular emergency situation, you will receive from the Peace Corps Country Staff additional information and instruction concerning the characteristics of the disaster, the type of danger or damage which might occur and specific precautionary measures to be taken.

The information on the Country Disaster Hazard Location Sheet (page A11) is provided to place in perspective the potential for disaster occurrence and to enable you to anticipate the cause and type of damage which might occur. It describes the relative probability of occurrence based on past history and present knowledge and monitoring.

Special note needs to be made concerning civil disorders. Three situations of particular concern are:

1. Strikes and Demonstrations

   You should avoid strike and demonstration areas at all times. There may be instances in which the PCV or PCT is specifically requested to be present at their job site even though some type of civil disorder may occur. In such cases, the Peace Corps should be advised of the situation by you or your Host Country supervisor and Peace Corps' concurrence should be obtained.

   You should be made aware of the potential for such instances at your site. Peace Corps will prepare guidelines which will describe the issues, probable persons or groups, and circumstances which may lead to your presence in a demonstration or strike area. The guidelines will also identify specific activities and alternatives you should carry out if Peace Corps cannot be advised of the situation. Again, the best possible course of action is to avoid the area.

   Peace Corps will make every effort to inform you of possible civil disorders which should be avoided and anticipate actions (on-site Staff support, partial evacuation of Peace Corps personnel, etc.) which may be necessary.

2. Volunteer or Trainee Detention or Arrest

   There may be instances in which you will be requested to report to Host Country security, immigration, or law enforcement agencies on your work activities and to provide information as to your current address, etc. Reporting may be requested on a routine basis or you may be detained (for a short period) without prior notification. In instances of suspected civil or criminal wrongdoing you may be arrested.

   If you are detained or arrested, it is important that you (or someone who has knowledge of the situation) report your status to the Peace Corps (or the U.S. Embassy) as soon as possible.

   Peace Corps Staff will brief you on such situations and provide you with the following information:

a. The name, address, and local supervisor of all local entities which may request periodic reporting, or who have the authority to detain or arrest you.
b. All regulations which govern your conduct (including reporting) under which you may be subject to detention or arrest, and individual civil rights under Host Country national law.
c. Specific site information as to the possibility of detention or arrest, including a description of previous occurrences and the general procedures carried out by the involved authorities.
d. Specific actions you should carry out when reporting or if detained or arrested; required identification documents; information which may be given; and means of contacting the Peace Corps or the U.S. Embassy.

The Peace Corps Staff has prepared procedures to support you if you are detained or arrested. It is highly unlikely that this will happen. However, if it does, cooperate with the authorities involved to the extent possible and make sure that the Peace Corps or the U.S. Embassy is contacted immediately.

3. Kidnapping

The possibility of you being kidnapped during your service in Peace Corps is very remote. However, the Peace Corps Staff will brief you on specific country issues concerning kidnappings and the following information will be provided:

a. Geographical areas where there is a possibility of kidnappings taking place.
b. Description of groups or organizations which might attempt a kidnapping, including identification of persons, known sympathizers, political orientation, previous history in the area, and probable demands which would be placed to secure the return of a hostage.
c. The name, address, and local supervosor of all law enforcement entities in your site.
d. Safeguards to be taken by you to deter kidnapping attempts including identification of safe areas (towns, roads, etc.), preferred means of travel, conduct while at your site, association with friends and strangers, and use of your residence as a safe place.

e. Most appropriate conduct you are to assume based on dealing with similar situations within the country.
f. Description of activities which will take place if you are kidnapped.
g. Instructions on actions to be taken by you when you are released if kidnapped.

The Peace Corps Staff in collaboration with the U.S. Embassy and the State Department in Washington have prepared procedures to be followed to deal with kidnappings if they should occur in your country of service. Remember that the possibility of kidnapping Peace Corps personnel is very remote, and that following instructions on deterring the occasion for kidnapping at your site further reduces that possibility.

E. Precautionary Measures in Housing

While probably no structure in your site is completely free of the hazards presented by a disaster (fire, wind, rain, etc.), you should examine your house for vulnerability to hazards, correct the situation if possible, or find other housing if necessary.

Listed below are the major disaster hazards which may occur and the critical areas for examination and action.

1. Water

Your house and lot should be on high ground, above the expected flood plain of a stream or river. Remember that relatively slight rises in water elevation can often flood vast areas of a waterway basin. The house should be on the highest portion of the lot. Water should drain easily away from the house and the lot into a street or natural drainage system.

Surrounding areas should not drain into or through the lot, nor should the run-off from neighboring roofs empty out onto your property. Check the house for signs of damage from flowing or standing water (erroded foundations and lower sections of the walls, water stains on walls, standing water in the yard or under the house). The house should be as water-tight as possible. Roofs should be in good repair with adequate drainage. Bathroom and kitchen drains, if present, may be susceptible to storm water surges because of combined sanitary and storm water sewers. Check for line condition and flooding potential.

2. Wind

The house should be structurally sound and securely attached to a good foundation. Roofing and siding materials should be firmly fastened and all glass panes in windows should be seated firmly and in good repair. When structures are of wood, cane, or other light-weight materials, they should be adequately cross-braced and of low height.

The house should stand away from surrounding trees, electric power poles, and other elements which could topple in high winds. Dead tree limbs should be trimmed away, and surrounding property should be checked for building materials or debris which could become airborne in high wind.

The house should be as tight as possible. In areas of potential high winds, shutters or other devices should be available to cover window and door openings. If possible, the house should have an interior room with no experior openings, which can serve as shelter during extremely high winds.

3. Fire

If possible, the house should be constructed of predominately non-flamable materials. This is most important in roofs, cooking areas or areas surrounding heating devices (fireplaces, space heaters, etc.). Check windows and doors to make sure they are operable for emergency exit or for closing off drafts. You should become acquainted with the local fire rescue and fire fighting procedures. Plan escape routes from your house and know the locations of several nearby water sources.

Clear the house and yard of dried vegetation, debris, and and other flamable trash. Carefully store flamable materials away from exposure to fire and heat. Check electric wiring for frayed or exposed wires, and for contact with wood, insulation, or other flamable building materials.

4. Seismic Movement and Land Slides

Insist that your house be structurally sound. Look for signs of previous or potential damage to the structure caused by earthquakes, tremors, land slides, or earth settling. These include cracked or uneven foundations, walls that are cracked or separated at their intersections, and cracks or separations running diagonally from the corner of wall openings to the intersection with walls, floor, or ceiling.

In zones particularly susceptible to earthquakes, structures should have continuous horizontal reinforcing at the foundation (floor), lintel (top of doors and windows) level, and at the top of the walls. Roofs should be of light weight material and structural roofing members should be securely fastened to walls. Roofs of clay tile or other masonry materials should be avoided. Structures of lightweight construction (wood, cane, etc.) should be diagonally reinforced.

Make sure doors and windows are fully operable; they could become partially jammed during an earthquake. Plan exit routes from the house and clear these paths of obstacles or items which could fall, blocking the exit, or strike you (chairs, protruding shelves, hanging plants, etc.), as a quick exit may be necessary in darkness. Avoid houses with exits to large open spaces (plazas, patios, etc.) through long, or walled corridors or stairways. Remember, in case of an earthquake, you must get to a clear, open space safe from collapsing walls or roofs immediately. Select a well built, sound doorway (preferably in an exterior wall) to stand in if exits become blocked.

Examine the house for susceptibility of the structure to damage from land slides above the house or from the earth sliding away from the foundation. Look for neighboring walls or structures which might strike the house or obstruct open, safety areas if they should collapse or slide.

F. Emergency Supplies

During a national or local emergency, supplies of all kinds will probably be in demand and hard to get. For this reason it is suggested that you maintain staple food stuffs and other essential supplies in your home at a level which could support your needs for at least a week during an emergency.

In addition, you should always have available and ready for use the following items.

1. A copy of the Volunteer and Trainee Disaster Preparedness Manual;
2. One gallon of boiled water in a covered container;
3. Water purification tablets (minimum of 2 bottles of 50 tablets each);
4. Flashlight with extra batteries and/or candles and matches for at least 50 hours;
5. First Aid or Volunteer Medical Kit (including insect repellent and toilet paper). Medical Kits are available to you from the Peace Corps Country Medical Office. Check with that office if you need replacement or additional supplies;
6. Food staples such as rice, beans, salt, and canned meats;
7. Vitamin pills for at least 2 weeks;
8. Pocket knife;
9. Fuel for preparing food for at least 7 days;
10. Radio or access to a radio so you can listen to emergency messages; and
11. Rain gear and blankets.

G. U.S. Embassy and Washington Disaster Relief Organization and Operations

1. U.S. Embassy

In the event of an emergency the U.S. Government responds only to specific requests made by the government of each striken country through the U.S. Ambassador. In such cases, the Ambassador initiates disaster relief activities by declaring (under specific regulations) that a disaster warrants U.S. assistance and that the assistance is acceptable to the Host Country government.

The Ambassador will designate a Country Disaster Relief Team and its director, who is often the Mission Director of USAID in the country. Previously prepared disaster relief plans, of which the Peace Corps Staff have been advised, will go into effect.

2. USAID

Upon notification by the U.S. Ambassador that a disaster has occurred and assistance is requested, the Foreign Disaster Relief Coordination Task Force, under the direction of the USAID Administrator in Washington, is mobilized. The Administrator is the U.S. President's Special Coordinator for International Disaster Assistance and his designated Task Force will have at its disposal the equipment and personnel of the various U.S. departments and agencies. These will be called upon to assist in estimating disaster damage and relief needs, purchasing and transporting relief supplies, and placing and supporting personnel in the affected areas. The Task Force will operate an Operations Center on a 24 hour-a-day basis which will be the collection and distribution point for information concerning the disaster and offers of assistance.

3. Peace Corps/Washington

Upon notification of a foreign disaster, Peace Corps/Washington will establish a Coordination Team which will include representatives from the Region Office and OSS. The Team will assign staff, request appropriate ACTION offices to be on stand-by alert for assistance, channel and relay information concerning Peace Corps Staff, Volunteer, and Trainee safety and whereabouts, and channel offers of disaster relief supplies and personal assistance.

The Coordination Team will be in constant contact with the Task Force and may place a member of the Team at the Operations Center if necessary. Otherwise, the Task Force will provide the Team with the most current information on Peace Corps personnel status and assistance needs, to which the Team will respond. Returned Peace Corps Volunteers should make contact directly with the Coordination Team when interested in participating in disaster relief activities.

H. Peace Corps/Country Disaster Relief Organization and Operation

Because the U.S. Ambassador is the official head of the U.S. Mission in the country, the Peace Corps Director will consult with the Ambassador in deciding to implement emergency procedures. The Director will decide if the situation warrants the undertaking of procedures to verify the well-being of Volunteers and Trainees country-wide. The Director will also decide, with concurrence of the Ambassador, whether or not to initiate emergency procedures for utilization of Peace Corps resources to assist in the relief effort.

If a disaster occurs which dictates emergency procedures, the Peace Corps Director will place in operation a Peace Corps/Country Coordination Team (PC/CCT) and assign a Staff Member as Team Leader. The PC/CCT will be staffed by Volunteers and office personnel in the national office. If available, a Peace Corps regional office may also serve as a center for the PC/CCT to augment the national office team, or to serve in a place of the national office if the emergency is local in scope.

The purpose of the Team is to:

1. Account for the safety and whereabouts of all Staff, Volunteers, and Trainees in country;
2. Handle incoming inquiries and outgoing information concerning Peace Corps personnel status;
3. Advise the Country Director of personnel status;
4. Alert Peace Corps Administration and Medical Offices of possible assistance needs;
5. Identify and prepare Peace Corps resources (personnel and supplies) for use in disaster relief operations;
6. Receive, evaluate, and prepare responses to requests for Peace Corps participation in relief activities; and
7. Monitor Peace Corps personnel participation in relief activities.

The Team Leader will manage the Team's Staff composed of the following:

1. Information Assistants (2)
2. Communications Assistant (1)
3. Supply Assistant (1)
4. Emergency Relief Assistant (1)
5. Secretary (1)

In accordance with the situation, the Team may operate on a 24 hour-a-day basis and draw on additional Volunteer support as needed. While the Team will coordinate PCV and PCT participation in disaster relief activities, its primary responsibility will be to determine the safety and whereabouts of Peace Corps personnel. All other activities will be subordinate to that activity until it is completed.

Peace Corps may be asked to participate in and/or establish and manage a coordination center for all foreign voluntary assistance programs. This center would receive and direct requests for assistance from various sources and identify resources. Its organization may be along the lines of the PC/CCT, but will not replace the need for the PC/CCT to direct Peace Corps' response to the emergency.

III. Immediate Response to a Disaster Situation

A. Reporting of Safety and Whereabouts

When a disaster occurs, whether local or national in scope, it is your responsibility to immediately report your safety and whereabouts to the Peace Corps. Carry out the following actions as soon as possible after the emergency occurs.

1. Communicate with your Program Manager or Peace Corps Director by the most reliable means of communication available. Be sure to include the following information when reporting your status:
    a. Name,
    b. Location,
    c. Date and time of communication,
    d. State of health and extent of injuries, if any, and
    e. Address and means by which communications can be maintained with you.
2. Stay in your site. If you are not at your site, indicate when reporting your safety and whereabouts any travel plans back to your site or to a Peace Corps office. Include the name and address of a person who can confirm that you undertook the planned travel.
3. If you must leave your site, advise Peace Corps directly of travel plans or identify a person in your site who will always know of your whereabouts.
4. If you cannot personally report your status, have your Peace Corps buddy or some other responsible person report directly to Peace Corps for you.
5. Listen for radio broadcasts for instructions and information from Peace Corps concerning the emergency and procedures you are to carry out.
6. If it is necessary for you to evacuate your site, follow instructions and cooperate with Peace Corps Staff and/or Host Country authorities.

B. Response to the Disaster Situation

1. Travel
   If in an unaffected area, do not go into disaster areas without specific instructions from Peace Corps. If you are in a disaster area, offer your assistance to local authorities after you have reported your safety and whereabouts to Peace Corps. Remember that formal disaster relief assistance by the Peace Corps must be requested by the Host Country government through the U.S. Ambassador.

2. Emergency Supplies
   Review your emergency supplies and ration supplies (food, fuel, water, medicine) (see Section II-F) to meet needs over a 7 day period.

3. Announcements and Instructions
   Be alert for public announcements concerning health and safety (food and water distribution, immunization, medical treatment, curfews, etc.) and follow instructions.

4. Information Reporting and News Media
   Report on the status of Peace Corps personnel, damage and relief efforts as specifically requested by Peace Corps and/or appropriate Host Country government agencies. Share the information you possess with only those local or national entities which instructed you to gather it. Direct inquiries concerning Peace Corps personnel, damage, or relief efforts from those outside Peace Corps to the Peace Corps Director. Do not make statements, even off the record, to news media representatives, unless specifically instructed to do so by the Peace Corps Staff.

5. Personal Documents
   Carry all personal documents you have at your site on your person to facilitate identification and travel.

6. Personal Dwelling Assessment
   Inspect the condition of your dwelling and vacate it if it is found to be damaged or endangered by nearby structures, seismic movement, weather conditions, water, etc. If in doubt, seek professional advice if available, or temporarily locate in a safe structure or space until proper assessment can be made.

IV. Disaster Assistance Phases and Operations

A. Assistance, Assessment, Requests and Responses

After all Peace Corps personnel has been accounted for, the Country Director, in conjunction with the U.S. Embassy and Host Country officials, should assess the damage and any need for outside assistance anticipated at the time and notify the Peace Corps/Washington Coordination Team (PC/WCT). If the Host Country requests assistance and the American Ambassador concurs, Peace Corps personnel in the affected area may be employed in the relief effort immediately. In the event of possible need for outside relief assistance, the Peace Corps Director, upon advising the Ambassador, should offer additional assistance.

PC/WCT will request other Peace Corps countries in the Region to identify currently serving Volunteers who would be available for short term transfers to fill scarce skill requests. If outside assistance is approved, the Country Director will select from those Volunteers identified and PC/WCT will coordinate their transfer to the affected area.

B. Disaster Assistance Activity Areas and Programming Issues

1. Emergency Relief Phase (1-4 weeks)

a. Activity Areas

Peace Corps Volunteers and Trainees are most often requested to participate in four areas of emergency relief work. These are:

1. Distribution of relief supplies (food, medicine, provisional shelter materials, etc.) and giving comfort to disaster victims.
2. Administration of relief supply distribution programs.
3. Damage assessment, identification of assistance needs, and assignment of relief resources.
4. Provision of scarce skills needed in relief operations (medical, construction, and communication personnel).

Distribution of relief supplies and administration of corresponding programs are set up in individual communities and are activities in which you may be asked to participate once your own personal situation has stabilized and you have reported to Peace Corps your safety and whereabouts. Local groups, both public and private in nature, will organize these activities and will most likely depend on national and international agencies for supplies. You are urged to cooperate with local officials when lending assistance.

As comprehensive assessment of damage is undertaken and needed resources are identified, including scarce skills, you may be asked to survey damaged areas away from your site so that complete damage estimates may be made and aid channeled to priority areas. If you have a scarce skill, you may also be requested to travel to another location where you are needed. Be sure that you are equipped for travel away from your site and that you keep Peace Corps Staff informed of your whereabouts and activities.

b. Programming Issues

During the emergency relief period you will be making day-to-day decisions affecting the type and extent of your involvement in emergency relief activities. These decisions should be in accordance with instructions you have received from Peace Corps. Activities which include decisions pertaining to the distribution of relief supplies should be examined carefully and discussed with Peace Corps Staff. Responsibility for making such decisions should be made with care and you should strive to implement procedures which place distribution of relief supply decisions, particularly at a local level, with Host Country nationals (individuals or organizations) or designated international relief agencies.

c. Physical and Mental Condition

Emergency relief work is physically and mentally exhausting, particularly for those who experiences the actual disaster. Do not be surprised if you become tired or depressed as you try to fulfill the many needs you will see about you. Try to keep as regular a routine of sleeping and eating as possible. If you feel yourself becoming physically exhausted or extremely depressed, seek rest immediately and relax until you regain your strength. If possible, leave the area where you are and visit the Peace Corps office and the PC/CCT to share information and receive advice and instructions. You can lend assistance only if you remain alert, strong, and composed.

2. Rehabilitation Phase (1-4 months)

a. Activity Areas

Following emergency relief efforts, which will be accomplished to varying degrees in different locations, rehabilitation activities will be initiated. These activities will be concentrated in the areas of infrastructure, community facilities, communications, and housing. Many of the activities begun in this phase will be funded into the reconstruction phase.

Specific activities which will be carried out include the following:

1. Infrastructure
    - a. Opening of roads and repair or replacement of bridges,
    - b. Opening of rail lines and stations,
    - c. Restoration of electrical power,
    - d. Repair of potable water systems,
    - e. Repair of sewerage systems, including treatment facilities, and
    - f. Resumption of port and airport services.
2. Community Facilities
    The repair or provision of temporary structures for:
    - a. Hospitals and clinics,
    - b. Government administration and service facilities,
    - c. Educational facilities,
    - d. Markets, and
    - e. Transportation terminals.
3. Communications
    - a. Restoration of telephone service,
    - b. Restoration of telegraph service,
    - c. Restoration of postal service, and
    - d. Restoration of radio and television broadcasts.
4. Housing
    - a. Provision of temporary family shelters,
    - b. Distribution of building materials, and
    - c. Provision of shelter for orphans and child daycare centers.

b. Programming Issues

At this point Peace Corps Staff will take the lead in programming Volunteers and Trainees into these activities. Comprehensive programming procedures will be followed to allow for the most appropriate use of Peace Corps personnel, including Volunteers from other countries and Returned Peace Corps Volunteers who may be requested to join the rehabilitation activities.

Activities during this phase will tend to be structured and as programs develop, lines of communication and authority will be established. Emphasis will be placed on using your particular skill and problem solving ability to carry out rehabilitation programs on a day-to-day basis.

You will discuss with the appropriate Peace Corps Staff member your proposed involvement in a rehabilitation program, the job description, and its relation to Peace Corps goals. You will be placed in the job with the approval of the U.S. Embassy and Peace Corps Director and with the understanding that prior Peace Corps concurrence will be necessary before changes in your site or job description take place. Peace Corps will reserve the right to withdraw Volunteers and Trainees from the program at its discretion.

c. Requesting Agencies

Most requests for Peace Corps support will be generated from international disaster relief agencies who will be working independently or in close coordination with a particular Host Country entity at the local, regional, or national level. These agencies have gained valuable experience through dealing with past disasters and most likely will be carrying out previously developed rehabilitation programs.

The requests may include jobs for administrative personnel to hire, fire, and manage Host Country national staff as well as make critical decisions on the dispursement of building materials and supplies at the local level. The degree to which they promote or allow Host Country nationals to participate in decision-making in the areas of program management and distribution of goods will vary greatly. Rehabilitation assistance is extremely competitive among international agencies as well as national entities as evidenced in media reports on specific program policies and operations following past major disasters. This situation is often intensified by assignment of specific geographical areas or communities to assistance agencies by the Host Country government, which obviates competitive atmospheres.

It must be remembered that most international agencies depend on donations and grants to support their relief programs and they must ensure the success of their activities to encourage funding. Peace Corps Staff will want comments and observations you bring from the field on programming issues as these are discussed and decisions made as to appropriate Peace Corps participation.

3. Reconstruction Phase (1-5 years)

a. Assessment

Reconstruction programs are specifically designed to address any readjustment in post-disaster priorities as envisioned by the Host Country. Assessment of participation in reconstruction should begin during the rehabilitation phase and follow Peace Corps programming procedures. Both Host Country agencies and Peace Corps will revise and reset their priorities to include reconstruction assistance. For Peace Corps, this may mean the cancellation of planned programs, the mounting of specialized programs to meet specific reconstruction needs, and/or an emphasis in programming special placement Volunteers with unusual skills.

b. Programming

New or expanded programs in the reconstruction sector would draw on skills such as architects, engineers, carpenters and other construction trades, physical and occupational therapists, environmental scientists, conservationists, demographers, cartographers, and agronomists, to name a few. Projects to be carried out include the following:

1. Housing construction,
2. Public building construction,
3. Irrigation systems,
4. Road construction,
5. Potable water and sewerage systems,
6. Rural electrification,
7. Public health programs, and
8. Food and tools for work.

Participant Ref. #9/1

A GUIDE TO EMERGENCY HEALTH MANAGEMENT AFTER NATURAL DISASTER

Scientific Publication No. 407

PAN AMERICAN HEALTH ORGANIZATION
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Washington, D.C. 20037, U.S.A.

1981

AN OVERVIEW

Sudden natural disasters are often believed to cause not only widespread death but also massive social disruption and outbreaks of epidemic disease and famine which leave survivors entirely dependent on outside relief. Systematic observation of the effects of disaster on human health has led to rather different conclusions, both about the effects of disaster on health and about the most effective ways of providing relief. Though all disasters are unique in that they affect areas with differing social, medical, and economic backgrounds, there are still similarities between disasters which, if recognized, can optimize the management of health relief and use of resources (see Table 1). The following points may be noted:

(1) There is a relationship between the type of disaster and its effect on health. This is particularly true of the immediate impact in causing injuries: earthquakes regularly cause many injuries requiring medical care, while floods and tidal waves cause relatively few.

(2) Some effects are a potential rather than an inevitable threat to health. For example, population movement and other environmental changes may lead to increased risk of disease transmission, although epidemics generally do not result from disasters.

(3) The actual and potential health risks after disaster do not all occur at the same time. Instead, they tend to arise at different times and to vary in importance within a disaster-affected area. Thus, casualties occur mainly at the time and place of im-

Table 1. Short-term effects of major natural disaster.

Effect	Earthquakes	High winds (without flooding)	Tidal waves/flash flood	Floods
Deaths	Many	Few	Many	Few
Severe injuries requiring extensive care	Overwhelming	Moderate	Few	Few
Increased risk of communicable diseases	Potential risk following all major disasters (Probability rising with overcrowding and deteriorating sanitation)			
Food scarcity	Rare (may occur due to factors other than food shortage)	Rare	Common	Common
Major population movements	Rare (may occur in heavily damaged urban areas)	Rare	Common	Common

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pact and require immediate medical care, while the risks of increased disease transmission take longer to develop and are greatest where there is crowding and standards of sanitation have declined.

(4) Disaster-created needs for food, shelter, and primary health care are usually not total. Even displaced persons often salvage some of the basic necessities of life. Further, people generally recover quickly from their immediate shock and spontaneously engage in search and rescue, transport of the injured, and other private relief activities.

Effective health relief management hence depends on anticipating and as they arise identifying problems and delivering specific materials at the precise times and points where they are needed. The ability to transport maximum supplies and personnel to a disaster area is much less essential.

Health Problems Common to All Disasters

Social Reactions

Behavior after a major disaster is only rarely generalized panic or stunned waiting. Spontaneous yet highly organized individual action occurs as survivors rapidly recover from their initial shock and set about purposefully achieving clear ends. Earthquake survivors often begin search and rescue activities minutes after an impact and within hours may have organized themselves in groups to transport the injured to medical posts. Actively antisocial behavior such as widespread looting occurs only in exceptional circumstances.

Although everyone thinks his spontaneous reactions are entirely rational, they may be detrimental to the community's higher interests. A person's conflicting roles as family head and health official, for instance, have in some instances resulted in key relief people not reporting to duty until their relatives and property are safe.

Rumors abound, particularly of epidemics. As a result, considerable pressure may be put on the authorities to undertake relief work such as mass vaccination against typhoid or cholera for which there is no sound technical reason. In addition, people may be reluctant to submit to relief measures which the authorities think necessary. After earthquakes or before predicted floods, for example, people are reluctant to evacuate even if their homes have been or are likely to be completely destroyed.

These patterns of behavior have two major implications for those making decisions about relief programs. First, patterns of behavior and demands for relief can be limited and modified by keeping the population informed and by obtaining necessary information before embarking on extended relief programs. Second, the population itself will provide most rescue and first aid, take the injured to hospitals if they are accessible, build temporary shelters, and carry out other essential tasks. Additional resources should therefore be directed toward meeting needs survivors themselves cannot meet.

Communicable Disease

Disaster does not usually result in outbreaks of infectious diseases, although in certain circumstances it does increase the potential for disease transmission. The most frequently observed increases in disease are caused by fecal contamination of water and food; hence, such diseases are mainly enteric.

The risk of epidemic communicable diseases is proportional to population density and displacement, which increases the load on water and food and its risk of contamination, as in refugee camps, disruption of preexisting sanitary services such as piped water and sewerage, and failure to maintain or restore normal public health programs in the immediate postdisaster period.

In the longer run, an increase in vector-borne diseases may occur in some areas because of disruption of vector control efforts. Residual insecticides may be washed away from buildings and the number of mosquito breeding sites may increase. As an example, 75,000 cases of malaria occurred in Haiti in the five months following the October 3-4, 1963, hurricane there.

Population Displacements

When large spontaneous or organized population movements occur, an urgent need to provide relief is created. People may move to urban areas where public services cannot cope, and the result may be an increase in morbidity and mortality. Thus, 6,000 excess deaths occurred in Dacca, Bangladesh, after floods there in 1974. If much housing has been destroyed, large population movements may occur within urban areas as people seek shelter with relatives and friends. Surveys of settlements and towns around Managua following the December 23, 1972, earthquake in Nicaragua indicated that 80 to 90 per cent of the 200,000 people displaced were living with relatives and friends, 5 to 10 per cent were living in parks, city squares, and vacant lots, and the remainder were living in schools and other buildings.

Climatic Exposure

The health hazards of exposure to the elements are small, even after disasters in cold countries. As long as the population is dry, reasonably well clothed, and able to find windbreaks, death from exposure does not appear to be a major risk. The need to provide emergency shelter therefore varies greatly with local conditions; it may be needed for other reasons.

Food and Nutrition

Food shortages in the immediate aftermath may arise in two ways. Food stock destruction within the disaster area may reduce the absolute amount of food available, or disruption of distribution systems may curtail access to food even if there is no absolute shortage. Generalized food shortages severe enough to cause nutritional problems do not occur after earthquakes.

Flooding and sea surges often damage household food stocks and crops, disrupt distribution, and cause major local shortages. Food distribution, at least in the short term, is often a major and urgent need, but large-scale distribution is not always necessary.

Mental Health

Anxiety, neuroses, and depression are not major, acute public health problems following disasters, and family and neighbors can deal with them temporarily. Wherever possible, efforts should be made to preserve family and community social structures. The indiscriminate use of sedatives and tranquilizers during the emergency relief phase is strongly discouraged. In developed countries, mental health problems are reported to be significant during long-term rehabilitation and reconstruction and may need to be dealt with during that phase.

Health Problems Related to the Type of Disaster

Earthquakes

Usually because of dwelling destruction, earthquakes may cause many deaths (more than 10 per cent of the population) and injure large numbers of people. The toll depends mostly on three factors.

The first is housing type. Houses built of adobe or dry stone, even if only a single story high, are highly unstable and their collapse causes many deaths and injuries. Lighter forms of construction, especially wood-framing, have proved much less dangerous. After the 1976 earthquake in Guatemala, for example, a survey showed that in one village with a population of 1,577, all those killed (78) and severely injured had been in adobe buildings, whereas all residents of woodframe buildings survived. The second is the time of day at which the earthquake occurs. The last is population density, for the total number of deaths and injuries is likely to be much higher in densely populated areas.

The ratio of dead to injured after earthquakes has been found to be approximately 1 to 3 when they result from the primary shock.

There are large variations within disaster-affected areas. Mortalities of up to 85 per cent occasionally occur in towns close to an earthquake's epicenter. As an example, the September 1978 earthquake at Tabas-e-Golshan, Iran, killed 11,000 of the town's 13,000 residents. The ratio of dead to injured decreases as the distance from the epicenter increases. Some age groups are more affected than others, for fit adults are spared more than small children and the old, who are less able to protect themselves.

Secondary disaster may occur after earthquakes and increase the number of casualties requiring medical attention. Historically, the greatest risk is from fire, although in recent decades postearthquake fires causing mass casualties have been uncommon.

Little information is available about the kinds of injuries resulting from earthquakes, but regardless of the number of casualties, the broad pattern of injury is likely to be a mass of injured with minor cuts and bruises, a smaller group suffering from simple fractures, and another group with serious multiple fractures or internal injuries requiring surgery and other intensive treatment. After the 1968 earthquake south of Khorasan, Iran, for example, only 368 (3.3 per cent) of 11,254 people treated by emergency services (including some routine medical cases) required inpatient care.

Most demand for health services occurs within the first 24 hours. Injured people may appear at medical facilities only during the first three to five days, after which presentation patterns return almost to normal. A good example of the crucial importance of the timing of emergency care is seen in the number of admissions to a field hospital after the 1976 earthquake in Guatemala shown in Figure 1. From day 6 onward, admissions fell dramatically despite intensive casefinding in remote rural areas.

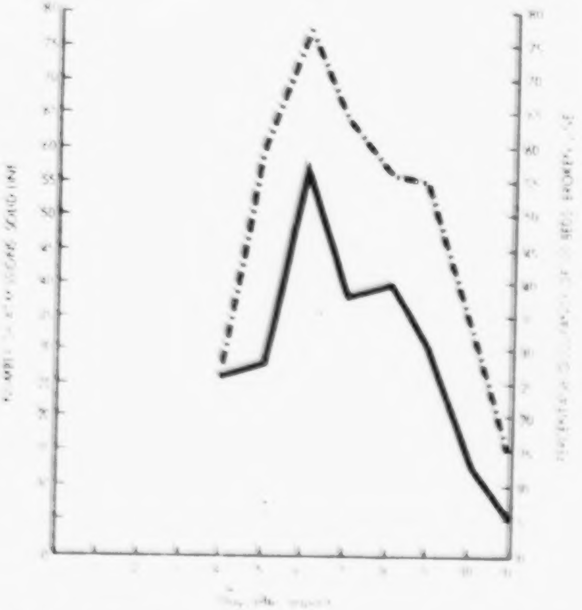

Figure 1. Admissions and occupancy rates at the field hospital in Chimaltenango, Guatemala, 1976.

Patients may appear in two waves, the first consisting of casualties from the immediate area around the medical facility and the second of referrals as relief operations in more distant areas become organized.

Destructive Winds

Unless they are complicated by secondary disasters such as the floods or sea surges often associated with them, destructive winds cause relatively few deaths and injuries. As an example, the major cyclone that in 1974 destroyed much of Darwin, Australia, a town of 45,000, caused only 51 deaths and led to a total of 145 hospital admissions, of which 110 were for severe lacerations and other relatively moderate trauma. Effective warning before such windstorms will limit morbidity and mortality, and most injuries will be relatively trivial.

Flash Floods and Sea Surges

These may cause much death but leave relatively few severely injured in their wake. Deaths result mainly from drowning and are commonest among the weakest members of the population. Thus, the November 1977 cyclone/sea surge disaster that affected a population of 700,000 in Andhra Pradesh, India, killed at least 10,000 people but left only 177 orthopedic cases (mostly arm and leg fractures) that required evacuation.

Floods

Slow flooding causes limited immediate morbidity and mortality. A slight increase in deaths from venomous snake bites has been reported but not fully substantiated, and traumatic injuries caused by flooding require only limited health care.

Since 1961 when the Peace Corps was created, more than 80,000 U.S. citizens have served as Volunteers in developing countries, living and working among the people of the Third World as colleagues and co-workers. Today 6000 PCVs are involved in programs designed to help strengthen local capacity to address such fundamental concerns as food production, water supply, energy development, nutrition and health education and reforestation.

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